STIC Search Report
Biotech-Chem Library

STIC Database Tracking Number: 170680

TO: Ralph J Gitomer **Location: rem/3D65/3C18** **Art Unit: 1655** **Thursday, November 10, 2005** **Case Serial Number: 10/511929**	**From: Paul Schulwitz** **Location: Biotech-Chem Library** **REM-1A65** **Phone: 571-272-2527** **Paul.schulwitz@uspto.gov**

Search Notes

Examiner Gitomer,

Please review the attached search results.
If you have any questions or if you would like to refine the search query, please feel free to contact me at any time.

Thank you for using STIC search services!

Paul Schulwitz
Technical Information Specialist
REM-1A65
571-272-2527

Application

L3 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:855724 HCAPLUS
DOCUMENT NUMBER: 139:319663
ENTRY DATE: Entered STN: 31 Oct 2003
TITLE: Fluorescence technique for on-line monitoring of state of hydrogen-producing microorganisms
INVENTOR(S): Seibert, Michael; Makarova, Valeriya; Tsygankov, Anatoly A.; Rubin, Andrew B.
PATENT ASSIGNEE(S): Midwest Research Institute, USA
SOURCE: PCT Int. Appl., 28 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
INT. PATENT CLASSIF.:
MAIN: A01G007-00
SECONDARY: C12M001-00; C12M001-34; C12N001-12; C12P001-00; C12P003-00; C12Q001-02; C12Q001-04
CLASSIFICATION: 9-5 (Biochemical Methods)
Section cross-reference(s): 10, 11
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003088736	A1	20031030	WO 2002-US12576	20020419
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 2005239044	A1	20051027	US 2004-511929	20041018 <--

PRIORITY APPLN. INFO.: WO 2002-US12576 W 20020419
PATENT CLASSIFICATION CODES:

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2003088736	ICM	A01G007-00
	ICS	C12M001-00; C12M001-34; C12N001-12; C12P001-00; C12P003-00; C12Q001-02; C12Q001-04
WO 2003088736	ECLA	C12M001/34H5; G01N033/50F
US 2005239044	NCL	435/004.000 <--

ABSTRACT:
In situ fluorescence method to monitor state of sulfur-deprived algal culture's ability to produce H2 under sulfur depletion, comprising: (a) providing sulfur-deprived algal culture; (b) illuminating culture; (c) measuring onset of H2 percentage in produced gas phase at multiple times to ascertain point immediately after anaerobiosis to obtain H2 data as function of time; and (d) determining any abrupt change in three in situ fluorescence parameters; (i) increase in Ft (steady-state level of chlorophyll fluorescence in light adapted cells); (ii) decrease in Fm' (maximal saturating light induced fluorescence level in light adapted cells); and (iii) decrease in Δ F/Fm' = (Fm'-Ft)/Fm' calculated photochem. activity of photosystem II (PSII) signaling full reduction of plastoquinone pool between PSII and PSI, which indicates start of anaerobic conditions that induces synthesis of hydrogenase enzyme for subsequent H2

production that signal oxidation of plastoquinone pool asmain factor to regulate H2 under sulfur depletion.

SUPPL. TERM: fluorescence technique monitoring hydrogen microorganism
INDEX TERM: Anaerobiosis
Chlamydomonas reinhardtii
Chlorella vulgaris
Electroluminescent devices
Fluorometry
Microorganism
Photosystem II
Scenedesmus obliquus
Signal transduction, biological
(fluorescence technique for online monitoring of state of hydrogen-producing microorganisms)
INDEX TERM: Chlorophylls, biological studies
Plastoquinones
ROLE: BSU (Biological study, unclassified); BIOL (Biological study)
(fluorescence technique for online monitoring of state of hydrogen-producing microorganisms)
INDEX TERM: **7704-34-9**, Sulfur, biological studies
ROLE: BSU (Biological study, unclassified); BIOL (Biological study)
(depletion; fluorescence technique for online monitoring of state of hydrogen-producing microorganisms)
INDEX TERM: **1333-74-0**, Hydrogen, biological studies
9027-05-8, Hydrogenase
ROLE: BSU (Biological study, unclassified); BIOL (Biological study)
(fluorescence technique for online monitoring of state of hydrogen-producing microorganisms)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD.
REFERENCE(S): (1) Anastasios; US 20010053543 A1 2001 HCAPLUS
(2) Boichenko; Biofizika 1983, V28(6), P976 HCAPLUS
(3) McTavish; US 6410258 B1 2002 HCAPLUS
(4) Serodio, J; Photosynthesis:Mechanisms and Effects 1998, VV, P4109

IT **7704-34-9**, Sulfur, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(depletion; fluorescence technique for online monitoring of state of hydrogen-producing microorganisms)
RN 7704-34-9 HCAPLUS
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT **1333-74-0**, Hydrogen, biological studies **9027-05-8**, Hydrogenase
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(fluorescence technique for online monitoring of state of hydrogen-producing microorganisms)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 9027-05-8 HCAPLUS
CN Hydrogenase (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

L4 ANSWER 1 OF 1 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2004-011657 [01] WPIX
DNN N2004-008581 DNC C2004-003331
TI On-line monitoring of state of sulfur-deprived algal culture's ability to produce hydrogen under sulfur depletion, comprises illuminating sample of culture containing photosynthetic components, with artificial or natural illumination.
DC D16 E36 J04 P13 S03
IN MAKAROVA, V; RUBIN, A B; SEIBERT, M; TSYGANKOV, A A
PA (MIDE) MIDWEST RES INST; (MAKA-I) MAKAROVA V; (RUBI-I) RUBIN A B; (SEIB-I) SEIBERT M; (TSYG-I) TSYGANKOV A A
CYC 100
PI WO 2003088736 A1 20031030 (200401)* EN 28 A01G007-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW
AU 2002256298 A1 20031103 (200438) A01G007-00
US 2005239044 A1 20051027 (200571) C12Q001-00
ADT WO 2003088736 A1 WO 2002-US12576 20020419; AU 2002256298 A1 AU 2002-256298 20020419, WO 2002-US12576 20020419; US 2005239044 A1 WO 2002-US12576 20020419, **US 2004-511929 20041018**
FDT AU 2002256298 A1 Based on WO 2003088736
PRAI WO 2002-US12576 20020419
IC ICM A01G007-00; C12Q001-00
ICS C12M001-00; C12M001-34; C12N001-12; C12P001-00; C12P003-00; C12Q001-02; C12Q001-04
AB WO2003088736 A UPAB: 20040102
NOVELTY - On-line monitoring of the state of a sulfur-deprived algal culture to ascertain the culture's ability to produce hydrogen under sulfur depletion, by in situ fluorescence, comprising illuminating a sample of sulfur-deprived algal culture containing photosynthetic components, with artificial or natural illumination; determining the onset of hydrogen photoproduction; and determining any abrupt change in three in situ fluorescence parameters, is new.

DETAILED DESCRIPTION - On-line monitoring of the state of a sulfur-deprived algal culture to ascertain the culture's ability to produce hydrogen (H2) under sulfur depletion, by in situ fluorescence, comprises illuminating a sample of sulfur-deprived algal culture containing photosynthetic components, with artificial or natural illumination; determining the onset of H2 photoproduction by measuring the percentage of H2 in a produced gas phase at multiple times to ascertain the point immediately after the anerobiosis after the physiological phases of oxygen (O2) production and O2 consumption sequence to obtain data regarding H2 as a function of time; and determining any abrupt change in three in situ fluorescence parameters. The parameters consist of an abrupt increase in Ft (the steady-state level of chlorophyll fluorescence in light adapted in cells); an abrupt decrease in Fm (the maximal saturating light induced fluorescence level in light adapted cells); and a precipitous abrupt decrease in Delta F/Fm' = (Fm'-Ft)Fm' (the calculated photochemical activity of photosystem II (PSII)) that signals the full reduction of the plastoquinone pool between PSII and PSI, which indicates the start of anaerobic conditions that in turn induces the synthesis of the hydrogenase enzyme required for subsequent H2 production, and slowing down of the abrupt decrease and partial recovery of Delta F/Fm' signal at

least partial oxidation of the plastoquinone pool as the main factor to regulate H2 production under sulfur depletion.

USE - For on-line monitoring of the state of sulfur-deprived algal culture's ability to produce hydrogen (H2) under sulfur depletion.

ADVANTAGE - The method provides information about the state of the culture without using electrodes inserted directly into the culture medium, and thus precluding the possibility of a source of (a) culture contamination and the need to sterilize electrodes, and (b) gas, including oxygen and hydrogen, leaks, to produce a non-destructive, remote sensing procedure.

Dwg.0/5

TECH WO 2003088736 A1UPTX: 20040102

TECHNOLOGY FOCUS - BIOLOGY - Preferred Components: The algal culture is an oxygenic photosynthetic microorganism that has a hydrogenase, which is green alga. The green alga is Chlamydomonas reinhardtii (preferably), Scenedesimus obliguus, or Chlorella vulgaris.

TECHNOLOGY FOCUS - INSTRUMENTATION AND TESTING - Preferred Method: The abrupt increase in Ft is determined using a fluorometer employing a weak modulated pulse-probe fluorescence method. The situ measurement of fluorescence is at lambda greater than 710 nm. It is performed with an optical fiber probe affixed onto a surface of an illuminated glass containing fluorescence excited sample or with a lens system. It may be performed with a fluorometer or lens set close to the edge of the bioreactor. A saturated actinic excitation pulse is applied on top of the weak modulated probe pulse. The saturated actinic excitation pulse is a 0.8 second pulse lambda less than 710 nm, 1200 mumol/m2 second2 PAR from an 8 V/20 W halogen lamp. The actinic light is 655 nm, 250 mumol/m2 second2 PAR from a LED array for 2 seconds for fluorescence induction. The saturating actinic excitation pulse is applied on top of a weak modulated probe that flashes at 3 microsecond pulses from a 655 nm light-emitting diode at frequencies of 600 Hz or 20 kHz. Efficiency of photochemical conversion of absorbed light energy in PSII is calculated after dark adaptation, where Fv/Fm = (Fm-Fo)/Fm. It may be calculated under steady-state actinic light illumination, where DELTA F/Fm' = (Fm'-Ft)/Fm'.

KW [1] 97153-0-0-0 CL DET PRD; 90793-1-0-0 CL DET

FS CPI EPI GMPI

FA AB; DCN

MC CPI: D05-H08; D05-H09; E05-B01; E06-D18; E11-M; E11-Q03L; E31-A02; E31-A03; J04-C02

EPI: S03-E04D; S03-E14H

DRN 1532-P; 1532-U

CMC UPB 20040102

M3 *01* C101 C550 C810 M411 M720 M750 M904 M905 N102 N132 N134 N141 N480 N512 N513 Q232

DCN: R01532-K; R01532-A; R01532-P

M3 *02* A212 A960 C710 D011 D013 D016 D019 D023 E350 H7 H721 J0 J012 J2 J251 J271 J5 J561 M210 M211 M212 M226 M232 M240 M272 M282 M283 M312 M321 M332 M342 M372 M391 M411 M511 M520 M530 M540 M630 M750 M904 M905 N102 N141 P832 Q232 Q505 Q613

RIN: 06561

DCN: RA01NL-K; RA01NL-A

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=> d his ful

     (FILE 'HOME' ENTERED AT 13:21:24 ON 10 NOV 2005)

     FILE 'REGISTRY' ENTERED AT 13:21:35 ON 10 NOV 2005
                E HYDROGEN/CN
L1              1 SEA ABB=ON  PLU=ON  HYDROGEN/CN
                E SULFUR/CN
L2              1 SEA ABB=ON  PLU=ON  SULFUR/CN

     FILE 'HCAPLUS' ENTERED AT 13:21:53 ON 10 NOV 2005

     FILE 'REGISTRY' ENTERED AT 13:21:58 ON 10 NOV 2005
                D L1
                D L2

     FILE 'HCAPLUS' ENTERED AT 13:22:18 ON 10 NOV 2005
L3           7823 SEA ABB=ON  PLU=ON  L1(L)(BSU OR BIOL)/RL
L4          18248 SEA ABB=ON  PLU=ON  L2(L)(BSU OR BIOL)/RL
L5            259 SEA ABB=ON  PLU=ON  L3 AND L4
                E ALGAE/CT
                E E3+ALL
L6          22823 SEA ABB=ON  PLU=ON  ALGAE+PFT,NT/CT
                E CHLAMYDMONAS/CT
                E CHLAMYDOMONAS/CT
                E CHLAMYDOMONAS REIN/CT
                E E4+ALL
                E E2+ALL
L7           4606 SEA ABB=ON  PLU=ON  CHLAMYDOMONAS REINHARDTII+PFT/CT
                E CHLORELLA VULGAR/CT
                E E4+ALL
L8           2266 SEA ABB=ON  PLU=ON  CHLORELLA VULGARIS+PFT,NT/CT
                E SCENEDESMUS OBLIQ/CT
                E E4+ALL
L9           1025 SEA ABB=ON  PLU=ON  SCENEDESMUS OBLIQUUS+PFT,NT/CT
L10                QUE ABB=ON  PLU=ON  CHLAMYDOMONAS REINHARD? OR CHLORELLA
                   VULGAR? OR SCENEDESMUS OBLIQU?
                E CHLOROPHYLLS/CT
                E E3+ALL
L11         32205 SEA ABB=ON  PLU=ON  CHLOROPHYLLS+PFT,NT/CT(L)(BSU OR BIOL)/RL
                   OR CHLOROPHYLLS, BIOLOGICAL STUDIES/CT
L12            20 SEA ABB=ON  PLU=ON  (L6 OR L7 OR L8 OR L9 OR L10 OR L11) AND
                   L5
L*** DEL       20 S L12 AND L1
                E US2004-5119292/APPS
                E US2004-511929/APPS
L13             1 SEA ABB=ON  PLU=ON  US2004-511929/AP
L14             1 SEA ABB=ON  PLU=ON  L12 AND L13
L15                QUE ABB=ON  PLU=ON  ?FLUORESC? OR ?FLUOROM? OR ELECTROLUMIN?
                   OR ?LUMINES? OR PHOTOSYSTEM OR SIGNAL(2A)TRANSDUC?
L16             7 SEA ABB=ON  PLU=ON  L12 AND L15
L17            20 SEA ABB=ON  PLU=ON  L12 OR L16
L18                QUE ABB=ON  PLU=ON  (L2 OR S OR SULFUR OR SULPHUR) AND
                   (DEPRIV? OR DEPLET? OR LACK?) AND (L1 OR HYDROGEN OR H2)
                D L10
L19                QUE ABB=ON  PLU=ON  CHLAMYDOMONAS REINHARD? OR CHLORELLA
                   VULGAR? OR SCENEDESMUS OBLIQU? OR ALGAL? OR ALGAE? OR CHLOROPHY
                   L?
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L20          44 SEA ABB=ON  PLU=ON  L15 AND L19 AND L18
                D TRIAL
                D TRIAL 2-10
                D KWIC L20
                D L18
L21             QUE ABB=ON  PLU=ON  (L2 OR S OR SULFUR OR SULPHUR) AND
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                D L15
L22             QUE ABB=ON  PLU=ON  ?FLUORESC? OR ?FLUOROM? OR ELECTROLUMIN?
                OR ?LUMINES? OR SIGNAL(2A)TRANSDUC?
L23          21 SEA ABB=ON  PLU=ON  L19 AND L21 AND L22
                D TRIAL 1-10
                D KWIC 7
                D L21
L24             QUE ABB=ON  PLU=ON  (L2 OR SULFUR OR SULPHUR) AND (DEPRIV? OR
                DEPLET? OR LACK? OR DEFIC?) AND (L1 OR HYDROGEN OR H2)
L25           4 SEA ABB=ON  PLU=ON  L22 AND L19 AND L24
                D TRIAL 1-4
L26          17 SEA ABB=ON  PLU=ON  L23 NOT L25
                D TRIAL 1-17

     INDEX '1MOBILITY, 2MOBILITY, ABI-INFORM, ADISCTI, AEROSPACE, AGRICOLA,
     ALUMINIUM, ANABSTR, ANTE, APOLLIT, AQUALINE, AQUASCI, AQUIRE, BABS,
     BIBLIODATA, BIOBUSINESS, BIOCOMMERCE, BIOENG, BIOSIS, BIOTECHABS,
     BIOTECHDS, BIOTECHNO, BLLDB, CABA, CANCERLIT, ...' ENTERED AT 13:52:42 ON
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                SEA L19 AND L22 AND L24
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               0*  FILE 2MOBILITY
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               0*  FILE BIOCOMMERCE
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  0*  FILE IFICLS
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  0*  FILE IMSDRUGNEWS
  0*  FILE INFODATA
  0*  FILE INIS
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              0*  FILE WTEXTILES
L27            QUE ABB=ON  PLU=ON  L19 AND L22 AND L24
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     MEDLINE, WPIDS, SCISEARCH, BIOSIS, IFIPAT, PROMT, ABI-INFORM, EMBASE,
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L28         1997 SEA ABB=ON  PLU=ON  L27
                 D KWIC

     FILE 'ABI-INFORM, AGRICOLA, BIOSIS, EMBASE, ENCOMPPAT, ESBIOBASE, IFIPAT,
     MEDLINE, NLDB, WPIX' ENTERED AT 14:14:23 ON 10 NOV 2005
L29           17 SEA ABB=ON  PLU=ON  L22 AND L19 AND L24
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INDEX 'CAOLD, CAPLUS, CASREACT, CROPU, DGENE, DPCI, ENCOMPPAT, EPFULL, FRANCEPAT, FRFULL, FSTA, GBFULL, IFIPAT, IMSPATENTS, INPADOC, JAPIO, KOREAPAT, LITALERT, NTIS, PAPERCHEM2, PATDD, PATDPA, PATDPAFULL, PATDPASPC, PCTFULL, PCTGEN, PIRA, PROUSDDR, PS, ...' ENTERED AT 14:15:47 ON 10 NOV 2005

FILE 'HCAPLUS' ENTERED AT 14:16:49 ON 10 NOV 2005

D L19
D L22
D L24

L30 QUE ABB=ON PLU=ON (SULFUR OR SULPHUR)(3A)(DEPRIV? OR DEPLET? OR LACK? OR DEFIC?) AND (HYDROGEN OR H2)

INDEX 'CAOLD, CAPLUS, CASREACT, CROPU, DGENE, DPCI, ENCOMPPAT, EPFULL, FRANCEPAT, FRFULL, FSTA, GBFULL, IFIPAT, IMSPATENTS, INPADOC, JAPIO, KOREAPAT, LITALERT, NTIS, PAPERCHEM2, PATDD, PATDPA, PATDPAFULL, PATDPASPC, PCTFULL, PCTGEN, PIRA, PROUSDDR, PS, ...' ENTERED AT 14:18:18 ON 10 NOV 2005

SEA L22 AND L19 AND L30

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0*	FILE TULSA2
17	FILE USPATFULL
3	FILE WPIDS
0*	FILE WPINDEX

L31 QUE ABB=ON PLU=ON L22 AND L19 AND L30

FILE 'EPFULL, PCTFULL, USPATFULL' ENTERED AT 14:31:58 ON 10 NOV 2005

L32 32 SEA ABB=ON PLU=ON L31

FILE HOME

FILE REGISTRY
Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 8 NOV 2005 HIGHEST RN 866995-49-5
DICTIONARY FILE UPDATES: 8 NOV 2005 HIGHEST RN 866995-49-5

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH JULY 14, 2005

Please note that search-term pricing does apply when conducting SmartSELECT searches.

****
* *
* The CA roles and document type information have been removed from *
* the IDE default display format and the ED field has been added, *
* effective March 20, 2005. A new display format, IDERL, is now *
* available and contains the CA role and document type information. *
* *
****

Structure search iteration limits have been increased. See HELP SLIMITS for details.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

http://www.cas.org/ONLINE/UG/regprops.html

FILE HCAPLUS

FILE COVERS 1907 - 10 Nov 2005 VOL 143 ISS 20
FILE LAST UPDATED: 9 Nov 2005 (20051109/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE MEDLINE
FILE LAST UPDATED: 9 NOV 2005 (20051109/UP). FILE COVERS 1950 TO DATE.

On December 19, 2004, the 2005 MeSH terms were loaded.

The MEDLINE reload for 2005 is now available. For details enter HELP RLOAD at an arrow promt (=>). See also:

http://www.nlm.nih.gov/mesh/
http://www.nlm.nih.gov/pubs/techbull/nd04/nd04_mesh.html

OLDMEDLINE now back to 1950.

MEDLINE thesauri in the /CN, /CT, and /MN fields incorporate the MeSH 2005 vocabulary.

This file contains CAS Registry Numbers for easy and accurate

substance identification.

FILE STNINDEX

FILE USPATFULL
FILE COVERS 1971 TO PATENT PUBLICATION DATE: 10 Nov 2005 (20051110/PD)
FILE LAST UPDATED: 10 Nov 2005 (20051110/ED)
HIGHEST GRANTED PATENT NUMBER: US6964061
HIGHEST APPLICATION PUBLICATION NUMBER: US2005251889
CA INDEXING IS CURRENT THROUGH 10 Nov 2005 (20051110/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 10 Nov 2005 (20051110/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Aug 2005
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Aug 2005

>>> USPAT2 is now available. USPATFULL contains full text of the <<<
>>> original, i.e., the earliest published granted patents or <<<
>>> applications. USPAT2 contains full text of the latest US <<<
>>> publications, starting in 2001, for the inventions covered in <<<
>>> USPATFULL. A USPATFULL record contains not only the original <<<
>>> published document but also a list of any subsequent <<<
>>> publications. The publication number, patent kind code, and <<<
>>> publication date for all the US publications for an invention <<<
>>> are displayed in the PI (Patent Information) field of USPATFULL <<<
>>> records and may be searched in standard search fields, e.g., /PN, <<<
>>> /PK, etc. <<<

>>> USPATFULL and USPAT2 can be accessed and searched together <<<
>>> through the new cluster USPATALL. Type FILE USPATALL to <<<
>>> enter this cluster. <<<
>>> <<<
>>> Use USPATALL when searching terms such as patent assignees, <<<
>>> classifications, or claims, that may potentially change from <<<
>>> the earliest to the latest publication. <<<

This file contains CAS Registry Numbers for easy and accurate
substance identification.

FILE PCTFULL
FILE LAST UPDATED: 8 NOV 2005 <20051108/UP>
MOST RECENT UPDATE WEEK: 200544 <200544/EW>
FILE COVERS 1978 TO DATE

>>> IMAGES ARE AVAILABLE ONLINE AND FOR EMAIL-PRINTS <<<

>>> KWIC format free of charge - SEE NEWS >>>

FILE EPFULL
FILE LAST UPDATED: 9 NOV 2005 <20051109/UP>
FILE COVERS 1978 TO DATE

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE
IN FIELDS /BI and /CLM. <<<

>>> File enhanced with backlog data
At June 06, 20, 21, 24, and 27, and July 18, 2005 bibliographies
for A-documents between 1978 and 1997 have been added to the
EPFULL file. Please consider this in your search strategy.
See HELP CURRENT for details. <<<

>>> KWIC format free of charge - SEE NEWS >>>

New: Legal Status, history display, search for old bibliographic data as well as detailed information on oppositions and licences are available as of October 23, 2005. See HELP CHANGE for detailed information.

FILE USPAT2

FILE COVERS 2001 TO PUBLICATION DATE: 10 Nov 2005 (20051110/PD)
FILE LAST UPDATED: 10 Nov 2005 (20051110/ED)
HIGHEST GRANTED PATENT NUMBER: US2005158476
HIGHEST APPLICATION PUBLICATION NUMBER: US2005251355
CA INDEXING IS CURRENT THROUGH 10 Nov 2005 (20051110/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 10 Nov 2005 (20051110/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Aug 2005
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Aug 2005

USPAT2 is a companion file to USPATFULL. USPAT2 contains full text of the latest US publications, starting in 2001, for the inventions covered in USPATFULL. USPATFULL contains full text of the original published US patents from 1971 to date and the original applications from 2001. In addition, a USPATFULL record for an invention contains a complete list of publications that may be searched in standard search fields, e.g., /PN, /PK, etc.

USPATFULL and USPAT2 can be accessed and searched together through the new cluster USPATALL. Type FILE USPATALL to enter this cluster.

Use USPATALL when searching terms such as patent assignees, classifications, or claims, that may potentially change from the earliest to the latest publication.

FILE GBFULL
FILE LAST UPDATED: 31 OCT 2005 <20051031/UP>
FILE COVERS 1979 TO DATE

>>> IMAGES ARE AVAILABLE ONLINE AND FOR EMAIL-PRINTS <<<

>>> KWIC format free of charge - SEE NEWS >>>

FILE CAPLUS

FILE COVERS 1907 - 10 Nov 2005 VOL 143 ISS 20
FILE LAST UPDATED: 9 Nov 2005 (20051109/ED)

Effective October 17, 2005, revised CAS Information Use Policies apply. They are available for your review at:

http://www.cas.org/infopolicy.html

FILE GENBANK

GENBANK (R) IS A REGISTERED TRADEMARK OF THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES.

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE WPIDS
FILE LAST UPDATED: 9 NOV 2005 <20051109/UP>
MOST RECENT DERWENT UPDATE: 200572 <200572/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE, PLEASE VISIT:
http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE http://thomsonderwent.com/coverage/latestupdates/ <<<

>>> FOR INFORMATION ON ALL DERWENT WORLD PATENTS INDEX USER GUIDES, PLEASE VISIT:
http://thomsonderwent.com/support/userguides/ <<<

>>> NEW! FAST-ALERTING ACCESS TO NEWLY-PUBLISHED PATENT DOCUMENTATION NOW AVAILABLE IN DERWENT WORLD PATENTS INDEX FIRST VIEW - FILE WPIFV.
FOR FURTHER DETAILS: http://www.thomsonderwent.com/dwpifv <<<

>>> THE CPI AND EPI MANUAL CODES HAVE BEEN REVISED FROM UPDATE 200501. PLEASE CHECK:
http://thomsonderwent.com/support/dwpiref/reftools/classification/code-rev FOR DETAILS. <<<

FILE SCISEARCH

FILE COVERS 1974 TO 3 Nov 2005 (20051103/ED)

SCISEARCH has been reloaded, see HELP RLOAD for details.

FILE BIOSIS
FILE COVERS 1969 TO DATE.
CAS REGISTRY NUMBERS AND CHEMICAL NAMES (CNs) PRESENT FROM JANUARY 1969 TO DATE.

RECORDS LAST ADDED: 9 November 2005 (20051109/ED)

FILE RELOADED: 19 October 2003.

FILE IFIPAT
FILE COVERS 1950 TO PATENT PUBLICATION DATE: 3 Nov 2005 (20051103/PD)
FILE LAST UPDATED: 4 Nov 2005 (20051104/ED)
HIGHEST GRANTED PATENT NUMBER: US6961956
HIGHEST APPLICATION PUBLICATION NUMBER: US2005246811
UNITERM INDEXING IS AVAILABLE IN THE IFIUDB FILE
UNITERM INDEXING LAST UPDATED: 31 Oct 2005 (20051031/UP)
INDEXING CURRENT THROUGH PAT PUB DATE: 27 May 2004 (20040527/PD)

IFIPAT reloaded on 9/22/05. Enter HELP RLOAD for details.

To ensure accurate searching using RANGE= or SET RANGE,
enter HELP RANGE at an arrow promt (=>).

FILE PROMT
FILE COVERS 1978 TO 10 NOV 2005 (20051110/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE ABI-INFORM
FILE COVERS 1971 TO PRESENT

FILE EMBASE
FILE COVERS 1974 TO 3 Nov 2005 (20051103/ED)

EMBASE has been reloaded. Enter HELP RLOAD for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE TOXCENTER

FILE COVERS 1907 TO 8 Nov 2005 (20051108/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TOXCENTER has been enhanced with new files segments and search fields.
See HELP CONTENT for more information.

TOXCENTER thesauri in the /CN, /CT, and /MN fields incorporate the MeSH 2005 vocabulary. See http://www.nlm.nih.gov/mesh/ and http://www.nlm.nih.gov/pubs/techbull/nd04/nd04_mesh.html for a description of changes.

FILE AGRICOLA

FILE COVERS 1970 TO 4 Nov 2005 (20051104/ED)

This file contains CAS Registry Numbers for easy and accurate

substance identification.

FILE ENCOMPPAT

FILE COVERS 1964 TO 4 Nov 2005 (20051104/ED)

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CAUTION: Some displays of the LT field are extremely long. Enter NEWS FILE at the arrow prompt for more information.

The Indexing Template (TD) field is available for some records starting with 940901/ED. Enter HELP TEMPLATE at an arrow prompt (=>) for information on how to use this field.

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE ESBIOBASE
FILE LAST UPDATED: 8 NOV 2005 <20051108/UP>
FILE COVERS 1994 TO DATE.

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN /CC, /ORGN, AND /ST <<<

FILE NLDB
FILE COVERS 1988 TO 10 NOV 2005 (20051110/ED)

FILE WPIX
FILE LAST UPDATED: 9 NOV 2005 <20051109/UP>
MOST RECENT DERWENT UPDATE: 200572 <200572/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE, PLEASE VISIT:
http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE http://thomsonderwent.com/coverage/latestupdates/ <<<

>>> FOR INFORMATION ON ALL DERWENT WORLD PATENTS INDEX USER GUIDES, PLEASE VISIT:
http://thomsonderwent.com/support/userguides/ <<<

>>> NEW! FAST-ALERTING ACCESS TO NEWLY-PUBLISHED PATENT DOCUMENTATION NOW AVAILABLE IN DERWENT WORLD PATENTS INDEX FIRST VIEW - FILE WPIFV.
FOR FURTHER DETAILS: http://www.thomsonderwent.com/dwpifv <<<

>>> THE CPI AND EPI MANUAL CODES HAVE BEEN REVISED FROM UPDATE 200501. PLEASE CHECK:
http://thomsonderwent.com/support/dwpiref/reftools/classification/code-rev FOR DETAILS. <<<

=> d que stat l17

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L1             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  HYDROGEN/CN
L2             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  SULFUR/CN
L3          7823 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L1(L)(BSU OR BIOL)/RL
L4         18248 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L2(L)(BSU OR BIOL)/RL
L5           259 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L3 AND L4
L6         22823 SEA FILE=HCAPLUS ABB=ON  PLU=ON  ALGAE+PFT,NT/CT
L7          4606 SEA FILE=HCAPLUS ABB=ON  PLU=ON  CHLAMYDOMONAS REINHARDTII+PFT/
                 CT
L8          2266 SEA FILE=HCAPLUS ABB=ON  PLU=ON  CHLORELLA VULGARIS+PFT,NT/CT
L9          1025 SEA FILE=HCAPLUS ABB=ON  PLU=ON  SCENEDESMUS OBLIQUUS+PFT,NT/CT

L10               QUE  ABB=ON  PLU=ON  CHLAMYDOMONAS REINHARD? OR CHLORELLA
                   VULGAR? OR SCENEDESMUS OBLIQU?
L11        32205 SEA FILE=HCAPLUS ABB=ON  PLU=ON  CHLOROPHYLLS+PFT,NT/CT(L)(BSU
                 OR BIOL)/RL OR CHLOROPHYLLS, BIOLOGICAL STUDIES/CT
L12           20 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L6 OR L7 OR L8 OR L9 OR L10
                 OR L11) AND L5
L15               QUE  ABB=ON  PLU=ON  ?FLUORESC? OR ?FLUOROM? OR ELECTROLU
                  MIN? OR ?LUMINES? OR PHOTOSYSTEM OR SIGNAL(2A)TRANSDUC?
L16            7 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 AND L15
L17           20 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 OR L16


=> d que stat l29
L1             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  HYDROGEN/CN
L2             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  SULFUR/CN
L19               QUE  ABB=ON  PLU=ON  CHLAMYDOMONAS REINHARD? OR CHLORELLA
                   VULGAR? OR SCENEDESMUS OBLIQU? OR ALGAL? OR ALGAE? OR CH
                  LOROPHYL?
L22               QUE  ABB=ON  PLU=ON  ?FLUORESC? OR ?FLUOROM? OR ELECTROLU
                  MIN? OR ?LUMINES? OR SIGNAL(2A)TRANSDUC?
L24               QUE  ABB=ON  PLU=ON  (L2 OR SULFUR OR SULPHUR) AND (DEPRI
                  V? OR DEPLET? OR LACK? OR DEFIC?) AND (L1 OR HYDROGEN OR
                  H2)
L29           17 SEA L22 AND L19 AND L24


=> d que stat l32
L19               QUE  ABB=ON  PLU=ON  CHLAMYDOMONAS REINHARD? OR CHLORELLA
                   VULGAR? OR SCENEDESMUS OBLIQU? OR ALGAL? OR ALGAE? OR CH
                  LOROPHYL?
L22               QUE  ABB=ON  PLU=ON  ?FLUORESC? OR ?FLUOROM? OR ELECTROLU
                  MIN? OR ?LUMINES? OR SIGNAL(2A)TRANSDUC?
L30               QUE  ABB=ON  PLU=ON  (SULFUR OR SULPHUR)(3A)(DEPRIV? OR D
                  EPLET? OR LACK? OR DEFIC?) AND (HYDROGEN OR H2)
L31               QUE  ABB=ON  PLU=ON  L22 AND L19 AND L30
L32           32 SEA L31


=> dup rem l17 l29 l32
FILE 'HCAPLUS' ENTERED AT 14:36:12 ON 10 NOV 2005
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FILE 'BIOSIS' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'EMBASE' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'ENCOMPPAT' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'ESBIOBASE' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'IFIPAT' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'MEDLINE' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'NLDB' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'WPIX' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'EPFULL' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'PCTFULL' ENTERED AT 14:36:12 ON 10 NOV 2005

FILE 'USPATFULL' ENTERED AT 14:36:12 ON 10 NOV 2005

PROCESSING COMPLETED FOR L17
PROCESSING COMPLETED FOR L29
PROCESSING COMPLETED FOR L32
L33 54 DUP REM L17 L29 L32 (15 DUPLICATES REMOVED)
ANSWERS '1-20' FROM FILE HCAPLUS
ANSWER '21' FROM FILE ABI-INFORM
ANSWERS '22-23' FROM FILE BIOSIS
ANSWERS '24-25' FROM FILE IFIPAT
ANSWER '26' FROM FILE MEDLINE
ANSWER '27' FROM FILE NLDB
ANSWERS '28-29' FROM FILE WPIX
ANSWERS '30-32' FROM FILE EPFULL
ANSWERS '33-40' FROM FILE PCTFULL
ANSWERS '41-54' FROM FILE USPATFULL

=> d l33 ibib abs hitind 1-54

L33 ANSWER 1 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 1
ACCESSION NUMBER: 2005:58107 HCAPLUS
DOCUMENT NUMBER: 142:154372
TITLE: Modulation of sulfate permease for photosynthetic hydrogen production
INVENTOR(S): Melis, Anastasios; Wintz, Hsu-ching Chen
PATENT ASSIGNEE(S): The Regents of the University of California, USA
SOURCE: U.S. Pat. Appl. Publ., 63 pp., Cont.-in-part of U.S.

Ser. No. 350,298.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005014239	A1	20050120	US 2004-762769	20040121
US 2003162273	A1	20030828	US 2003-350298	20030122
WO 2005072254	A2	20050811	WO 2005-US1937	20050121

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.:

US 2002-354760P	P	20020204
US 2002-377902P	P	20020502
US 2003-350298	A2	20030122
US 2004-762769	A	20040121

AB Sustained H2 production is obtained by the culturing of a genetically-modified algae, where the ability of the chloroplasts to intake SO42- is reduced or eliminated compared to wild-type algae. The alga is cultured in a sealed environment in a liquid or solid medium that contains S, and H2 is generated continuously. Alternatively, the algae may be cultured in the presence of bacteria that also produce H2 gas. The H2 produced can be collected and used as a clean energy source.

IC ICM C12P003-00
ICS C12N001-12
INCL 435168000; 435257200
CC 16-5 (Fermentation and Bioindustrial Chemistry)
Section cross-reference(s): 52
IT Anaerobic bacteria
Chlamydomonas reinhardtii
Chlorophyta
Clostridium
DNA sequences
Fermentation
Genetic engineering
Photosynthesis, biological
Photosynthetic bacteria
Protein sequences
Rhodobacter sphaeroides
(modulation of sulfate permease for photosynthetic hydrogen production)
IT **1333-74-0P**, Hydrogen, preparation
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); **BIOL (Biological study)**; PREP (Preparation)
(modulation of sulfate permease for photosynthetic hydrogen production)
IT **7704-34-9**, Sulfur, biological studies
RL: **BSU (Biological study, unclassified)**; **BIOL (Biological study)**
(modulation of sulfate permease for photosynthetic hydrogen production)

L33 ANSWER 2 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 6
ACCESSION NUMBER: 2003:855724 HCAPLUS
DOCUMENT NUMBER: 139:319663
TITLE: **Fluorescence** technique for on-line monitoring of state of hydrogen-producing microorganisms
INVENTOR(S): Seibert, Michael; Makarova, Valeriya; Tsygankov, Anatoly A.; Rubin, Andrew B.
PATENT ASSIGNEE(S): Midwest Research Institute, USA
SOURCE: PCT Int. Appl., 28 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003088736	A1	20031030	WO 2002-US12576	20020419
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 2005239044	A1	20051027	US 2004-511929	20041018
PRIORITY APPLN. INFO.:			WO 2002-US12576 W	20020419

AB In situ **fluorescence** method to monitor state of sulfur-deprived algal culture's ability to produce H2 under sulfur depletion, comprising: (a) providing sulfur-deprived algal culture; (b) illuminating culture; (c) measuring onset of H2 percentage in produced gas phase at multiple times to ascertain point immediately after anaerobiosis to obtain H2 data as function of time; and (d) determining any abrupt change in three in situ **fluorescence** parameters; (i) increase in Ft (steady-state level of chlorophyll **fluorescence** in light adapted cells); (ii) decrease in Fm' (maximal saturating light induced **fluorescence** level in light adapted cells); and (iii) decrease in Δ F/Fm' = (Fm'-Ft)/Fm' calculated photochem. activity of **photosystem** II (PSII) signaling full reduction of plastoquinone pool between PSII and PSI, which indicates start of anaerobic conditions that induces synthesis of hydrogenase enzyme for subsequent H2 production that signal oxidation of plastoquinone pool asmain factor to regulate H2 under sulfur depletion.

IC ICM A01G007-00
ICS C12M001-00; C12M001-34; C12N001-12; C12P001-00; C12P003-00; C12Q001-02; C12Q001-04

CC 9-5 (Biochemical Methods)
Section cross-reference(s): 10, 11

ST **fluorescence** technique monitoring hydrogen microorganism

IT Anaerobiosis
Chlamydomonas reinhardtii
Chlorella vulgaris
Electroluminescent devices
Fluorometry
Microorganism

Photosystem II
Scenedesmus obliquus
Signal transduction, biological
(**fluorescence** technique for online monitoring of state of hydrogen-producing microorganisms)

IT **Chlorophylls, biological studies**
Plastoquinones
RL: **BSU (Biological study, unclassified)**; **BIOL (Biological study)**
(**fluorescence** technique for online monitoring of state of hydrogen-producing microorganisms)

IT **7704-34-9**, Sulfur, biological studies
RL: **BSU (Biological study, unclassified)**; **BIOL (Biological study)**
(depletion; **fluorescence** technique for online monitoring of state of hydrogen-producing microorganisms)

IT **1333-74-0**, Hydrogen, biological studies 9027-05-8, Hydrogenase
RL: **BSU (Biological study, unclassified)**; **BIOL (Biological study)**
(**fluorescence** technique for online monitoring of state of hydrogen-producing microorganisms)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 3 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 7
ACCESSION NUMBER: 2003:634036 HCAPLUS
DOCUMENT NUMBER: 139:178821
TITLE: Modulation of sulfate permease for photosynthetic hydrogen production
INVENTOR(S): Melis, Anastasios; Wintz, Hsu-ching Chen
PATENT ASSIGNEE(S): The Regents of the University of California, USA
SOURCE: PCT Int. Appl., 80 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003067213	A2	20030814	WO 2003-US2198	20030124
WO 2003067213	A3	20040122		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 2003162273	A1	20030828	US 2003-350298	20030122
CA 2472765	AA	20030814	CA 2003-2472765	20030124
EP 1472338	A2	20041103	EP 2003-708872	20030124
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2005516629	T2	20050609	JP 2003-566515	20030124
PRIORITY APPLN. INFO.:			US 2002-354760P P	20020204

US 2002-377902P P 20020502
US 2003-350298 A 20030122
WO 2003-US2198 W 20030124

AB Sustained hydrogen production is obtained by the culturing of a genetically-modified algae, where the ability of the chloroplasts to intake sulfate is reduced or eliminated compared to wild-type algae. The alga is cultured in a sealed environment in a liquid or solid medium that contains sulfur, and hydrogen is generated continuously. Alternatively, the algae may be cultured in the presence of bacteria that also produce hydrogen gas. The hydrogen produced can be collected and used as a clean energy source. Thus the sulP gene of **Chlamydomonas reinhardtii** encoding a sulfate permease was isolated and characterized. This information was then used to construct a plasmid bearing an antisense fragment of the sulP gene. The antisense plasmid vector was then employed to obtain sulP knockout mutants of **Chlamydomonas reinhardtii.**

IC ICM G01N

CC 16-5 (Fermentation and Bioindustrial Chemistry)
Section cross-reference(s): 3, 10, 11, 52

IT **Chlamydomonas reinhardtii**
Chloroplast
Clostridium
DNA sequences
Electron transport system, biological
Energy metabolism, microbial
Genetic engineering
Genetic selection
Mitochondria
Molecular cloning
Oxidative phosphorylation, biological
Phosphorylation, biological
Photosynthesis, biological
Plasmid vectors
Protein folding
Protein sequences
Respiration, microbial
Rhodobacter sphaeroides
Solar radiation
Transcriptional regulation
Transformation, genetic
cDNA sequences
(modulation of sulfate permease for photosynthetic hydrogen production)

IT 124-38-9, Carbon dioxide, processes **7704-34-9**, Sulfur, processes 14808-79-8, Sulfate, processes
RL: BCP (Biochemical process); **BIOL (Biological study)**; PROC (Process)
(modulation of sulfate permease for photosynthetic hydrogen production)

IT **1333-74-0P**, Hydrogen, preparation
RL: BMF (Bioindustrial manufacture); **BIOL (Biological study)**; PREP (Preparation)
(modulation of sulfate permease for photosynthetic hydrogen production)

L33 ANSWER 4 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 9
ACCESSION NUMBER: 2003:151517 HCAPLUS
DOCUMENT NUMBER: 139:5721
TITLE: Effects of extracellular pH on the metabolic pathways in sulfur-deprived, H2-producing **Chlamydomonas reinhardtii** cultures
AUTHOR(S): Kosourov, Sergey; Seibert, Michael; Ghirardi, Maria L.

CORPORATE SOURCE: National Renewable Energy Laboratory, Golden, CO, 80401, USA
SOURCE: Plant and Cell Physiology (2003), 44(2), 146-155
CODEN: PCPHA5; ISSN: 0032-0781
PUBLISHER: Japanese Society of Plant Physiologists
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Sustained photoprodn. of H2 by the green alga, **Chlamydomonas reinhardtii**, can be obtained by incubating cells in sulfur-deprived medium [Ghirardi, M. L. et al. (2000) Trends Biotechnol. 18: 506; Melis, A. et al. (2000) Plant Physiol. 122: 127]. The current work focuses on (a) the effects of different initial extracellular pHs on the inactivation of **photosystem** II (PSII) and O2-sensitive H2-production activity in sulfur-deprived algal cells and (b) the relationships among H2-production, photosynthetic, aerobic and anaerobic metabs. under different pH regimens. The maximum rate and yield of H2 production occur when the pH at the start of the sulfur deprivation period is 7.7 and decrease when the initial pH is lowered to 6.5 or increased to 8.2. The pH profile of hydrogen photoprodn. correlates with that of the residual PSII activity (optimum pH 7.3-7.9), but not with the pH profiles of photosynthetic electron transport through **photosystem** I or of starch and protein degradation In vitro hydrogenase activity over this pH range is much higher than the actual in situ rates of H2 production, indicating that hydrogenase activity per se is not limiting. Starch and protein catabolisms generate formate, acetate and ethanol; contribute some reductant for H2 photoprodn., as indicated by 3-(3,4-dichlorophenyl)-1,1-dimethylurea and 2,5-dibromo-6-isopropyl-3- methyl-1,4-benzoquinone inhibition results; and are the primary sources of reductant for respiratory processes that remove photosynthetically generated O2. Carbon balances demonstrate that alternative metabolic pathways predominate at different pHs, and these depend on whether residual photosynthetic activity is present or not.

CC 16-5 (Fermentation and Bioindustrial Chemistry)
Section cross-reference(s): 10, 11, 52

IT Fermentation
(batch; extracellular pH effects on hydrogen photoprodn. and catabolic, fermentative, and photosynthetic metabolic pathways in sulfur-deprived **Chlamydomonas reinhardtii** cultures)

IT **Chlamydomonas reinhardtii**
Metabolic pathways
Photosynthesis, biological
(extracellular pH effects on hydrogen photoprodn. and catabolic, fermentative, and photosynthetic metabolic pathways in sulfur-deprived **Chlamydomonas reinhardtii** cultures)

IT **Photosystem** II
(extracellular pH effects on hydrogen photoprodn. and residual **photosystem** II activity in sulfur-deprived **Chlamydomonas reinhardtii** cultures)

IT Proteins
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(extracellular pH effects on hydrogen photoprodn. in sulfur-deprived **Chlamydomonas reinhardtii** cultures in relation to degradation of)

IT Electron transport system, biological
(photosynthetic; extracellular pH effects on hydrogen photoprodn. and catabolic, fermentative, and photosynthetic metabolic pathways in sulfur-deprived **Chlamydomonas reinhardtii** cultures)

IT Starvation, microbial

(sulfur deprivation; extracellular pH effects on hydrogen photoprodn. and catabolic, fermentative, and photosynthetic metabolic pathways in **Chlamydomonas reinhardtii** cultures under)

IT 7440-44-0, Carbon, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(balance in sulfur-deprived **Chlamydomonas reinhardtii** cells in relation to hydrogen photoprodn.)

IT **1333-74-0P**, Hydrogen, preparation
RL: BPN (Biosynthetic preparation); **BIOL (Biological study)**; PREP (Preparation)
(extracellular pH effects on hydrogen photoprodn. and catabolic, fermentative, and photosynthetic metabolic pathways in sulfur-deprived **Chlamydomonas reinhardtii** cultures)

IT 64-17-5, Ethanol, biological studies 64-18-6, Formic acid, biological studies 64-19-7, Acetic acid, biological studies **7704-34-9**, Sulfur, biological studies
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(extracellular pH effects on hydrogen photoprodn. and catabolic, fermentative, and photosynthetic metabolic pathways in sulfur-deprived **Chlamydomonas reinhardtii** cultures)

IT 9027-05-8, Hydrogenase
RL: BSU (Biological study, unclassified); CAT (Catalyst use); BIOL (Biological study); USES (Uses)
(extracellular pH effects on hydrogen photoprodn. in sulfur-deprived **Chlamydomonas reinhardtii** cultures in relation to)

IT 9005-25-8, Starch, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(extracellular pH effects on hydrogen photoprodn. in sulfur-deprived **Chlamydomonas reinhardtii** cultures in relation to degradation of)

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 5 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 10
ACCESSION NUMBER: 2001:924285 HCAPLUS
DOCUMENT NUMBER: 136:36496
TITLE: Hydrogen production using hydrogenase-containing oxygenic photosynthetic organisms
INVENTOR(S): Anastasios, Melis; Zhang, Liping; Benemann, John R.; Forestier, Marc; Ghirardi, Maria; Seibert, Michael
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 15 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 2001053543	A1	20011220	US 2000-748690		20001222
PRIORITY APPLN. INFO.:			US 1999-173391P	P	19991228

AB A reversible physiol. process provides for the temporal separation of oxygen evolution and hydrogen production in a microorganism, which includes the steps of growing a culture of the microorganism in medium under illuminated conditions to accumulate an endogenous substrate, depleting from the medium a nutrient selected from the group consisting of sulfur, iron, and/or manganese, sealing the culture from atmospheric oxygen, incubating the

culture in light whereby a rate of light-induced oxygen production is equal to or less than a rate of respiration, and collecting an evolved gas. The process is particularly useful to accomplish a sustained photobiol. hydrogen gas production in cultures of microorganisms, such as **Chlamydomonas reinhardtii.**

IC ICM C12P003-00
INCL 435168000
CC 16-5 (Fermentation and Bioindustrial Chemistry)
Section cross-reference(s): 11
IT **Chlamydomonas reinhardtii**
Energy metabolism, microbial
Photosynthesis, biological
Photosystem I
Photosystem II
Thylakoid membrane
(hydrogen production using hydrogenase-containing oxygenic photosynthetic organisms)
IT **Chlorophylls, biological studies**
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(hydrogen production using hydrogenase-containing oxygenic photosynthetic organisms)
IT **1333-74-0P**, Hydrogen, preparation
RL: BMF (Bioindustrial manufacture); **BIOL (Biological study);** PREP (Preparation)
(hydrogen production using hydrogenase-containing oxygenic photosynthetic organisms)
IT 50-99-7, Dextrose, biological studies 64-19-7, Acetic acid, biological studies 71-52-3, Bicarbonate, biological studies 124-38-9, Carbon dioxide, biological studies 7439-89-6, Iron, biological studies 7439-96-5, Manganese, biological studies **7704-34-9**, Sulfur, biological studies 7732-18-5, Water, biological studies 9005-25-8, Starch, biological studies 9027-05-8, Hydrogenase 9035-46-5, Cytochrome F
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(hydrogen production using hydrogenase-containing oxygenic photosynthetic organisms)

L33 ANSWER 6 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2005:163094 HCAPLUS
DOCUMENT NUMBER: 143:342434
TITLE: Production of H2 by sulphur-deprived cells of the unicellular cyanobacteria Gloeocapsa alpicola and Synechocystis sp. PCC 6803 during dark incubation with methane or at various extracellular pH
AUTHOR(S): Antal, T. K.; Lindblad, P.
CORPORATE SOURCE: Department of Physiological Botany, EBC, Uppsala University, Uppsala, Swed.
SOURCE: Journal of Applied Microbiology (2005), 98(1), 114-120
CODEN: JAMIFK; ISSN: 1364-5072
PUBLISHER: Blackwell Publishing Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB S deprivation in combination with the presence of methane (CH4) and changes in extracellular pH was examined as a method to enhance in situ hydrogen (H2) generation during fermentation in the unicellular non-diazotrophic cyanobacteria Gloeocapsa alpicola and Synechocystis PCC 6803. Level of H2

production, measured using a gas chromatog., was determined in S-deprived cells of G. alpicola and Synechocystis PCC 6803 during fermentation S starvation enhanced the rate of H2 production by more than 4-fold in both strains. S-deprived cyanobacteria were able to maintain maximum rate of H2 production during at least 8 h of fermentation representing the entire dark period of a day. Increased H2 production was observed during dark anoxic incubation with a gas phase of 100% CH4 (up to 4 times) at lower pH of the medium (5.0-5.5). S-deprivation in combination with CH4, added or maybe produced by another microorganism, and changes in the pH of the media can be used to further increase the specific capacity of unicellular non-N2-fixing cyanobacteria to produce H2 during fermentation with the overall aim of applying it for outdoor photobiol. H2 production S-deprivation with respect to H2 production is well studied in the green algae **Chlamydomonas reinhardtii** while its application for H2 production in cyanobacteria is novel. Similarly, the stimulation of H2 generation in the presence of CH4 opens up new possibilities to increase the H2 production Natural gas enriched with H2 seems to be a perspective fuel and may be an intermediate step on the pathway to the exploitation of pure biohydrogen.

CC 10-2 (Microbial, Algal, and Fungal Biochemistry)

IT 71-52-3, Bicarbonate, biological studies 74-82-8, Methane, biological studies **1333-74-0**, Hydrogen, biological studies **7704-34-9**, Sulfur, biological studies 9005-79-2, Glycogen, biological studies 9027-05-8, Hydrogenase
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(hydrogen production by sulfur-deprived unicellular cyanobacteria Gloeocapsa alpicola and Synechocystis sp. PCC 6803 during dark incubation with methane or at various extracellular pH)

REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 7 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:725106 HCAPLUS
DOCUMENT NUMBER: 142:89579
TITLE: Thiocapsa marina sp. nov., a novel, okenone-containing, purple sulfur bacterium isolated from brackish coastal and marine environments
AUTHOR(S): Caumette, Pierre; Guyoneaud, Remy; Imhoff, Johannes F.; Sueling, Joerg; Gorlenko, Vladimir
CORPORATE SOURCE: Laboratoire d'Ecologie Moleculaire, EA 3525, IBEAS, Universite de Pau et des Pays de l'Adour, Pau, F-64013, Fr.
SOURCE: International Journal of Systematic and Evolutionary Microbiology (2004), 54(4), 1031-1036
CODEN: ISEMF5; ISSN: 1466-5026
PUBLISHER: Society for General Microbiology
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Four marine, phototrophic, purple sulfur bacteria (strains 5811T, 5812, BM-3 and BS-1) were isolated in pure culture from different brackish to marine sediments in the Mediterranean Sea, the White Sea and the Black Sea. Single cells of these strains were coccus-shaped, non-motile and did not contain gas vesicles. The color of cell suspensions that were grown in the light was purple-red. Bacteriochlorophyll a and carotenoids of the okenone series were present as photosynthetic pigments. Photosynthetic membrane systems were of the vesicular type. Hydrogen sulfide, thiosulfate, elemental sulfur and mol. hydrogen were used as electron

donors during photolithotrophic growth under anoxic conditions; carbon dioxide was utilized as the carbon source. During growth on sulfide, elemental sulfur globules were stored inside the cells. In the presence of hydrogen sulfide, several organic substances could be photoassimilated. Comparative 16S rDNA sequence anal. revealed an affiliation of these four strains to the genus Thiocapsa. Both phylogenetic anal. and the results of DNA-DNA hybridization studies revealed that these strains formed a sep. cluster within the genus Thiocapsa. Thus, according to phenotypic characteristics and mainly the carotenoid composition, 16S rDNA sequence anal. and DNA-DNA hybridization data, it is proposed that these strains should be classified as a novel species, Thiocapsa marina sp. nov., with strain 5811T (=DSM 5653T=ATCC 43172T) as the type strain.

CC 10-4 (Microbial, Algal, and Fungal Biochemistry)
Section cross-reference(s): 3

IT 16840-70-3, Okenone **17499-98-8**, Bacteriochlorophyll a
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(Thiocapsa marina purple sulfur bacterium containing okenone, isolated from brackish coastal and marine environments)

IT **7704-34-9**, Sulfur, biological studies
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(stored intracellularly, used as electron donor; Thiocapsa marina purple sulfur bacterium containing okenone, isolated from brackish coastal and marine environments)

IT **1333-74-0**, Hydrogen, biological studies 7783-06-4, Hydrogen sulfide, biological studies 14383-50-7, Thiosulfate
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(used as electron donor; Thiocapsa marina purple sulfur bacterium containing okenone, isolated from brackish coastal and marine environments)

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 8 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:819525 HCAPLUS
DOCUMENT NUMBER: 142:52359
TITLE: The effect of light intensity on hydrogen production by sulfur-deprived **Chlamydomonas reinhardtii**
AUTHOR(S): Laurinavichene, Tatyana; Tolstygina, Irena; Tsygankov, Anatoly
CORPORATE SOURCE: Institute of Basic Biological Problems, Pushchino, Moscow Region, 142290, Russia
SOURCE: Journal of Biotechnology (2004), 114(1-2), 143-151
CODEN: JBITD4; ISSN: 0168-1656
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The effect of light intensity on hydrogen production by sulfur-deprived **Chlamydomonas reinhardtii** was studied in situ using either long- or short-term expts., or alternatively, with samples withdrawn from the photobioreactor. Overall hydrogen production by S-deprived culture was shown to depend on the light intensity and to exhibit regions of light limitation and light inhibition. The optimal incident light intensity for hydrogen production was independent of the method of sulfur deprivation or the initial acetate concentration in the medium (12-34 mM). However, it varied with the Chl concentration and the thickness of the photobioreactor. To calculate the average light intensity in the photobioreactor

under different exptl. conditions, a special mathematics approach was developed. The optimal average light intensity for H2 production appeared to be
30-40 μE m-2 s-1 and was independent of the Chl or acetate concns. and the method of S deprivation. The inhibitory effect of high light intensity was related to the enhanced O2 evolution activity during the photosynthetic stage of sulfur deprivation and to the high activity of **photosystem** II at the beginning of the H2-production phase. Data support the major role of **photosystem** II in supplying reductants through **photosystem** I to the hydrogenase throughout the H2-production phase.

CC 11-6 (Plant Biochemistry)

ST light hydrogen sulfur photosynthesis **photosystem** II **Chlamydomonas reinhardtii**

IT **Chlamydomonas reinhardtii**
Light
Mathematical methods
Photosynthesis, biological
Photosystem II
(effect of light intensity on hydrogen production by sulfur-deprived **Chlamydomonas reinhardtii**)

IT **Chlorophylls, biological studies**
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(effect of light intensity on hydrogen production by sulfur-deprived **Chlamydomonas reinhardtii**)

IT 64-19-7, Acetic acid, biological studies **1333-74-0**, Hydrogen, biological studies **7704-34-9**, Sulfur, biological studies 7782-44-7, Oxygen, biological studies
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(effect of light intensity on hydrogen production by sulfur-deprived **Chlamydomonas reinhardtii**)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 9 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:115120 HCAPLUS
DOCUMENT NUMBER: 138:384216
TITLE: Modelling continuous culture of Rhodospirillum rubrum in photobioreactor under light limited conditions
AUTHOR(S): Favier-Teodorescu, Lidia; Cornet, Jean-Francois; Dussap, Claude Gilles
CORPORATE SOURCE: CUST, Laboratoire de Genie Chimique et Biochimique, Universite Blaise Pascal, Aubiere, F-63174, Fr.
SOURCE: Biotechnology Letters (2003), 25(4), 359-364
CODEN: BILED3; ISSN: 0141-5492
PUBLISHER: Kluwer Academic Publishers
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Rhodospirillum rubrum was grown continuously and photoheterotrophically under light limitation using a cylindrical photobioreactor in which the steady state biomass concentration was varied between 0.4 to 4 kg m-3 at a constant
radiant incident flux of 100 W m-2. Kinetic and stoichiometric models for the growth are proposed. The biomass productivities, acetate consumption rate and the CO2 production rate can be quant. predicted to a high level of accuracy by the proposed model calcns.

CC 16-8 (Fermentation and Bioindustrial Chemistry)

Section cross-reference(s): 10
IT **1333-74-0**, Hydrogen, biological studies 7440-44-0, Carbon, biological studies **7704-34-9**, Sulfur, biological studies 7723-14-0, Phosphorus, biological studies 7727-37-9, Nitrogen, biological studies 7782-44-7, Oxygen, biological studies 26063-00-3, Poly(3-hydroxybutyrate)
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(cellular; modeling continuous culture of Rhodospirillum rubrum in photobioreactor under light limited conditions)
IT 124-38-9, Carbon dioxide, biological studies **17499-98-8**, Bacteriochlorophyll A
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(modeling continuous culture of Rhodospirillum rubrum in photobioreactor under light limited conditions)
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 10 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:808847 HCAPLUS
DOCUMENT NUMBER: 140:216214
TITLE: Shear stress tolerance and biochemical characterization of Phaeodactylum tricornutum in quasi steady-state continuous culture in outdoor photobioreactors
AUTHOR(S): Miron, Asterio Sanchez; Garcia, M. Carmen Ceron; Gomez, Antonio Contreras; Camacho, Francisco Garcia; Grima, Emilio Molina; Chisti, Yusuf
CORPORATE SOURCE: Department of Chemical Engineering, University of Almeria, Almeria, E-04071, Spain
SOURCE: Biochemical Engineering Journal (2003), 16(3), 287-297
CODEN: BEJOFV; ISSN: 1369-703X
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A bubble column and two airlift photobioreactors (a draft-tube sparged vessel and a split-cylinder device) of the same general design (0.19 m column diameter, 2 m tall, 0.06 m3 working volume) were evaluated for outdoor continuous culture of the microalga Phaeodactylum tricornutum at a dilution rate of 0.03 h-1. At a daily averaged irradiance (photosynthetically active) value of 900 μE m-2 s-1, all bioreactors attained a quasi steady-state biomass concentration of .apprx.1 kg m-3 and a biomass productivity of .apprx.0.3 kg m-3 per day when the aeration velocity was 0.01 m s-1. The microalgal cells were susceptible to aeration-associated hydrodynamic stress if the superficial aeration velocity exceeded 0.01 m s-1. Supplementing the culture medium with 0.02% or more CM-cellulose (CMC), allowed stable culture under conditions that had previously damaged the cells. The average elemental composition of the biomass was: 49.2% C, 6.3% H, 0.8% N, and 1.3% S. The chlorophylls, carotenoids, and pigments content of the biomass changed with irradiance within a given day. Low irradiance favored accumulation of the light capture pigments. Increasing daily irradiance led to accumulation of carbohydrates. Some of the carbohydrate accumulated during the day was consumed at night and partly converted to proteins. Eicosapentaenoic acid (EPA, 20:5n3) constituted between 27 and 30% of the total fatty acids present, or 2.6-3.1% of the dry biomass. The other main fatty acids present were palmetic acid (16:0), palmoleic acid

(16:1n7), and myristic acid (14:0). On average, these three fatty acids constituted 16.9% (16:0), 14.0% (16:1n7) and 9.4% (14:0) of the total fatty acids present.

CC 16-2 (Fermentation and Bioindustrial Chemistry)

IT Carbohydrates, biological studies
Carotenes, biological studies
Chlorophylls, biological studies
Fatty acids, biological studies
Proteins
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(shear stress tolerance and biochem. characterization of Phaeodactylum tricornutum in quasi steady-state continuous culture in outdoor photobioreactors)

IT 57-10-3, Palmitic acid, biological studies 373-49-9, Palmitoleic acid **479-61-8**, Chlorophyll a **519-62-0**, Chlorophyll b 544-63-8, Myristic acid, biological studies **1333-74-0**, Hydrogen, biological studies 7440-44-0, Carbon, biological studies **7704-34-9**, Sulfur, biological studies 7727-37-9, Nitrogen, biological studies **11003-45-5**, Chlorophyll c
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(shear stress tolerance and biochem. characterization of Phaeodactylum tricornutum in quasi steady-state continuous culture in outdoor photobioreactors)

REFERENCE COUNT: 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 11 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:156802 HCAPLUS
DOCUMENT NUMBER: 139:3425
TITLE: A new purple sulfur bacterium isolated from a littoral microbial mat, Thiorhodococcus drewsii sp. nov.
AUTHOR(S): Zaar, Annette; Fuchs, Georg; Golecki, Jochen R.; Overmann, Joerg
CORPORATE SOURCE: Mikrobiologie, Institut fuer Biologie II, Universtitaet Freiburg, Freiburg, 79104, Germany
SOURCE: Archives of Microbiology (2003), 179(3), 174-183
CODEN: AMICCW; ISSN: 0302-8933
PUBLISHER: Springer-Verlag
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A new strain of purple sulfur bacterium was isolated from a marine microbial mat sampled in Great Sippewissett Salt Marsh at the Atlantic coast (Woods Hole, Mass., USA). Single cells of strain AZ1 were coccus-shaped, highly motile by means of a single flagellum, and did not contain gas vesicles. Intracellular membranes were of the vesicular type. However, addnl. concentric membrane structures were present. The photosynthetic pigments were bacteriochlorophylla and carotenoids of the normal spirilloxanthin series, with rhodopsin as the dominant carotenoid. Hydrogen sulfide (up to 11 mM), sulfur, thiosulfate, and mol. hydrogen were used as electron donors during anaerobic phototrophic growth. During growth on sulfide, elemental sulfur globules were transiently stored inside the cells. Strain AZ1 is much more versatile than most other Chromatiaceae with respect to electron donor and organic substrates. In the presence of CO2, it is capable of assimilating C1-C5 fatty acids, alcs., and intermediates of the tricarboxylic acid cycle. Strain AZ1 could also grow photoorganotrophically with acetate as the sole photosynthetic electron donor. Chemotrophic growth in the dark under microoxic

conditions was not detected. Optimum growth occurred at pH 6.5-6.7, 30-35 °C, ≥50 μmol quanta m-2 s-1, and 2.4-2.6% NaCl. The DNA base composition was 64.5 mol% G+C. Comparative sequence anal. of the 16S rRNA gene confirmed that the isolate is a member of the family Chromatiaceae. Sequence similarity to the most closely related species, Thiorhodococcus minor DSMZ 11518T, was 97.8%; however, the value for DNA-DNA hybridization between both strains was only 20%. Because of the low genetic similarity and since strain AZ1 physiol. differs considerably from all other members of the Chromatiaceae, including Trc. minor, the new isolate is described as a new species of the genus Thiorhodococcus, Thiorhodococcus drewsii sp. nov.

CC 10-6 (Microbial, Algal, and Fungal Biochemistry)

IT 105-92-0, Rhodopin 502-65-8, Lycopene **1333-74-0**, Hydrogen, biological studies 5017-53-8 5085-16-5, Anhydrorhodovibrin **7704-34-9**, Sulfur, biological studies 7783-06-4, Hydrogen sulfide, biological studies 13833-01-7 14383-50-7, Thiosulfate (S2O32-) **17499-98-8**, Bacteriochlorophyll a 34255-08-8, Spirilloxanthin
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(new purple sulfur bacterium isolated from littoral microbial mat, Thiorhodococcus drewsii sp. nov.)

REFERENCE COUNT: 56 THERE ARE 56 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 12 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:967897 HCAPLUS
DOCUMENT NUMBER: 138:234883
TITLE: Probing green algal hydrogen production
AUTHOR(S): Zhang, Liping; Melis, Anastasios
CORPORATE SOURCE: Department of Plant and Microbial Biology, University of California, Berkeley, CA, 94720-3102, USA
SOURCE: Philosophical Transactions of the Royal Society of London, Series B: Biological Sciences (2002), 357(1426), 1499-1509
CODEN: PTRBAE; ISSN: 0962-8436
PUBLISHER: Royal Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The recently developed two-stage photosynthesis and H2-production protocol with green algae is further investigated in this work. The method employs S deprivation as a tool for the metabolic regulation of photosynthesis. In the presence of S, green algae perform normal photosynthesis, carbohydrate accumulation and oxygen production In the absence of S, normal photosynthesis stops and the algae slip into the H2-production mode. For the first time, to our knowledge, significant amts. of H2 gas were generated, essentially from sunlight and water. Rates of H2 production could be sustained continuously for ca. 80 h in the light, but gradually declined thereafter. This work examines biochem. and physiol. aspects of this process in the absence or presence of limiting amts. of S nutrients. Moreover, the effects of salinity and of uncouplers of phosphorylation are investigated. It is shown that limiting levels of S can sustain intermediate levels of oxygenic photosynthesis, in essence raising the prospect of a calibration of the rate of photosynthesis by the S content in the growth medium of the algae. It is concluded that careful titration of the supply of S nutrients in the green alga medium might permit the development of a continuous H2 production process.

CC 11-6 (Plant Biochemistry)

IT **Photosystem** II

(inhibition; regulation of hydrogen production by green algae by sulfur deprivation)
IT Anaerobiosis
Chlamydomonas reinhardtii
Chlorophyta
Protein degradation
Respiration, microbial
Solar radiation
Stress, microbial
Thylakoid membrane
(regulation of hydrogen production by green algae by sulfur deprivation)
IT **7704-34-9**, Sulfur, biological studies
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(deprivation; regulation of hydrogen production by green algae by sulfur deprivation)
IT **1333-74-0**, Hydrogen, biological studies
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(regulation of hydrogen production by green algae by sulfur deprivation)
REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 13 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:468802 HCAPLUS
DOCUMENT NUMBER: 137:124267
TITLE: Sustained hydrogen photoproduction by **Chlamydomonas reinhardtii**: effects of culture parameters
AUTHOR(S): Kosourov, Sergey; Tsygankov, Anatoly; Seibert, Michael; Ghirardi, Maria L.
CORPORATE SOURCE: Basic Sciences Center, National Renewable Energy Laboratory, Golden, CO, 80401, USA
SOURCE: Biotechnology and Bioengineering (2002), 78(7), 731-740
CODEN: BIBIAU; ISSN: 0006-3592
PUBLISHER: John Wiley & Sons, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The green alga C. reinhardtii is capable of sustained H2 photoprodn. when grown under S-deprived conditions. This phenomenon is a result of the partial deactivation of photosynthetic O2-evolution activity in response to S deprivation. At these reduced rates of water oxidation, oxidative respiration under continuous illumination can establish an anaerobic environment in the culture. After 10-15 h of anaerobiosis, S-deprived algal cells induce a reversible hydrogenase and start to evolve H2 gas in the light. Using a computer-monitored photobioreactor system, we investigated the behavior of S-deprived algae and found that: (1) the cultures transition through 5 consecutive phases: an aerobic phase, an O2-consumption phase, an anaerobic phase, a H2-production phase, and a termination phase; (2) synchronization of cell division during pre-growth with 14:10 h light:dark cycles leads to earlier establishment of anaerobiosis in the cultures and to earlier onset of the H2-production phase; (3) re-addition of small quantities of SO42- (12.5-50 μM MgSO4, final concentration) to either synchronized or unsynchronized cell suspensions results
in an initial increase in culture d., a higher initial sp. rate of H2 production, an increase in the length of the H2-production phase, and an increase

in the total amount of H2 produced; and (4) increases in the culture optical d. in the presence of 50 μM SO42- result in a decrease in the initial sp. rates of H2 production and in an earlier start of the H2-production phase with unsynchronized cells. We suggest that the effects of S re-addition on H2 production, up to an optimal concentration, are due to an increase in the residual water oxidation activity of the algal cells. We also demonstrate that, in principle, cells synchronized by growth under light:dark cycles can be used in an outdoor H2-production system without loss of efficiency compared to cultures that up until now have been pre-grown under continuous light conditions.

CC 16-5 (Fermentation and Bioindustrial Chemistry)

IT Anaerobiosis
Cell cycle
Chlamydomonas reinhardtii
Light
(sustained hydrogen photoprodn. by **Chlamydomonas reinhardtii**: effects of culture parameters)

IT **1333-74-0P**, Hydrogen, preparation
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); **BIOL (Biological study)**; PREP (Preparation)
(sustained hydrogen photoprodn. by **Chlamydomonas reinhardtii**: effects of culture parameters)

IT **7704-34-9**, Sulfur, biological studies 14808-79-8, Sulfate, biological studies
RL: **BSU (Biological study, unclassified)**; **BIOL (Biological study)**
(sustained hydrogen photoprodn. by **Chlamydomonas reinhardtii**: effects of culture parameters)

REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 14 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:741660 HCAPLUS
DOCUMENT NUMBER: 138:34711
TITLE: Search parameters for the remote detection of extraterrestrial life
AUTHOR(S): Schulze-Makuch, Dirk; Irwin, Louis N.; Guan, Huade
CORPORATE SOURCE: Department of Geological Sciences, University of Texas at El Paso, El Paso, TX, 79968-0555, USA
SOURCE: Planetary and Space Science (2002), 50(7-8), 675-683
CODEN: PLSSAE; ISSN: 0032-0633
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English

AB A review. Direct consequences of biol. activity (biosignatures) and alterations of the geol. environment due to biol. processes (geosignatures) are currently known only for the planet Earth. However, geoindicators remotely detectable by robotic technol. have revealed a number of sites in the solar system where conditions compatible with the support of life may exist. By focusing on a search for energy gradients, complex chemical, liqs. that may act as solvents, atmospheres, and indicators of geol. differentiation, robotic exploration of the solar system and beyond should lead to fruitful targets in the search for extraterrestrial life. An anal. of all major solar system bodies for these parameters suggests that Mars, Titan, and the Galilean satellites should be given the highest priority in the search for extraterrestrial life in our solar system. Extending them to other bodies in the solar system, however, draws

attention to Io, Triton, Titania, Enceladus, and Iapetus, among others, as worthy of greater attention.

CC 6-0 (General Biochemistry)

IT **Chlorophylls, biological studies**
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(search parameters for the remote detection of extraterrestrial life)

IT **7704-34-9**, Sulfur, biological studies
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(gases; search parameters for the remote detection of extraterrestrial life)

IT 74-82-8, Methane, biological studies 74-87-3, Methyl chloride, biological studies 74-88-4, Methyl iodide, biological studies **1333-74-0**, Hydrogen, biological studies 7664-41-7, Ammonia, biological studies 7782-44-7, Oxygen, biological studies
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(search parameters for the remote detection of extraterrestrial life)

REFERENCE COUNT: 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 15 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:111164 HCAPLUS
DOCUMENT NUMBER: 136:322150
TITLE: Biochemical and morphological characterization of sulfur-deprived and H2-producing **Chlamydomonas reinhardtii** (green alga)
AUTHOR(S): Zhang, Liping; Happe, Thomas; Melis, Anastasios
CORPORATE SOURCE: Department of Plant and Microbial Biology, University of California, Berkeley, CA, 94720 3102, USA
SOURCE: Planta (2002), 214(4), 552-561
CODEN: PLANAB; ISSN: 0032-0935
PUBLISHER: Springer-Verlag
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Sulfur deprivation in green algae causes reversible inhibition of photosynthetic activity. In the absence of S, rates of photosynthetic O2 evolution drop below those of O2 consumption by respiration. As a consequence, sealed cultures of the green alga **Chlamydomonas reinhardtii** become anaerobic in the light, induce the "Fe-hydrogenase" pathway of electron transport and photosynthetically produce H2 gas. In the course of such H2-gas production cells consume substantial amts. of internal starch and protein. Such catabolic reactions may sustain, directly or indirectly, the H2-production process. Profile anal. of selected photosynthetic proteins showed a precipitous decline in the amount of ribulose-1,5-bisphosphate carboxylase-oxygenase (Rubisco) as a function of time in S deprivation, a more gradual decline in the level of **photosystem** (PS) II and PSI proteins, and a change in the composition of the PSII light-harvesting complex (LHC-II). An increase in the level of the enzyme Fe-hydrogenase was noted during the initial stages of S deprivation (0-72 h) followed by a decline in the level of this enzyme during longer (t>72 h) S-deprivation times. Microscopic observations showed distinct morphol. changes in C. reinhardtii during S deprivation and H2 production Ellipsoid-shaped cells (normal photosynthesis) gave way to larger and spherical cell shapes in the initial stages of S deprivation and H2 production, followed by cell mass redns. after longer S-deprivation and H2-production times. It is suggested that, under S-deprivation conditions, electrons derived from a residual

PSII H2O-oxidation activity feed into the hydrogenase pathway, thereby contributing to the H2-production process in **Chlamydomonas reinhardtii**. Interplay between oxygenic photosynthesis, mitochondrial respiration, catabolism of endogenous substrate, and electron transport via the hydrogenase pathway is essential for this light-mediated H2-production process.

CC 11-6 (Plant Biochemistry)
Section cross-reference(s): 10

IT Anaerobiosis
Chlamydomonas reinhardtii
Electron transport
Photosynthesis, biological
Respiration, microbial
Starvation, microbial
(biochem. and morphol. characterization of sulfur-deprived and H2-producing **Chlamydomonas reinhardtii**)

IT **Chlorophylls, biological studies**
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(biochem. and morphol. characterization of sulfur-deprived and H2-producing **Chlamydomonas reinhardtii**)

IT **Photosystem** II
(light-harvesting complex; biochem. and morphol. characterization of sulfur-deprived and H2-producing **Chlamydomonas reinhardtii**)

IT Proteins
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(of **photosystem** I and II; biochem. and morphol. characterization of sulfur-deprived and H2-producing **Chlamydomonas reinhardtii**)

IT **Photosystem** I
Photosystem II
(proteins of; biochem. and morphol. characterization of sulfur-deprived and H2-producing **Chlamydomonas reinhardtii**)

IT 9027-05-8, Hydrogenase
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(Iron; biochem. and morphol. characterization of sulfur-deprived and H2-producing **Chlamydomonas reinhardtii**)

IT **1333-74-0**, Hydrogen, biological studies **7704-34-9**, Sulfur, biological studies 9005-25-8, Starch, biological studies 9027-23-0
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(biochem. and morphol. characterization of sulfur-deprived and H2-producing **Chlamydomonas reinhardtii**)

REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 16 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:110715 HCAPLUS
DOCUMENT NUMBER: 136:244585
TITLE: Relationship between **photosystem** 2 activity and hydrogen production in **Chlamydomonas reinhardtii** during sulfur deprivation
AUTHOR(S): Antal, T. K.; Kredeleva, T. E.; Laurinavichene, T. V.; Makarova, V. V.; Tsygankov, A. A.; Seibert, M.; Rubin, A. B.
CORPORATE SOURCE: Mosk. Gos. Univ. im. M. V. Lomonosova, Moscow, Russia
SOURCE: Doklady Akademii Nauk (2001), 381(1), 119-122

CODEN: DAKNEQ; ISSN: 0869-5652
PUBLISHER: MAIK Nauka
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB This work aimed to study the activity of **photosystem** 2 at all stages of adaptation of **Chlamydomonas reinhardtii** to sulfur deprivation. It was shown for the first time that at sulfur deprivation gradual decrease in **photosystem** 2 activity takes place. In anaerobic conditions quick and complete **photosystem** 2 inactivation occurs. After that slowly reactivation of **photosystem** 2 begins accompanied by mol. hydrogen formation.
CC 11-6 (Plant Biochemistry)
Section cross-reference(s): 10
ST **photosystem** II **Chlamydomonas reinhardtii** sulfur deprivation hydrogen
IT **Chlamydomonas reinhardtii**
(Dang c137+; relationship between **photosystem** 2 activity and hydrogen production in **Chlamydomonas reinhardtii** during sulfur deprivation)
IT Adaptation, microbial
Photosystem II
Redox potential
Stress, microbial
(relationship between **photosystem** 2 activity and hydrogen production in **Chlamydomonas reinhardtii** during sulfur deprivation)
IT **Chlorophylls, biological studies**
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(relationship between **photosystem** 2 activity and hydrogen production in **Chlamydomonas reinhardtii** during sulfur deprivation)
IT **1333-74-0**, Hydrogen, biological studies **7704-34-9**, Sulfur, biological studies
RL: **BSU (Biological study, unclassified); BIOL (Biological study)**
(relationship between **photosystem** 2 activity and hydrogen production in **Chlamydomonas reinhardtii** during sulfur deprivation)

L33 ANSWER 17 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:682330 HCAPLUS
DOCUMENT NUMBER: 138:283942
TITLE: Cyclic photobiological algal H2-production
AUTHOR(S): Ghirardi, Maria L.; Kosourov, Sergey; Seibert, Michael
CORPORATE SOURCE: National Renewable Energy Laboratory, Golden, CO, 80401, USA
SOURCE: Proceedings of the 2001 U.S. DOE Hydrogen Program Review, Baltimore, MD, United States, Apr. 17-19, 2001 (2001), 67-76. National Renewable Energy Laboratory: Golden, Colo.
CODEN: 69DAQY
DOCUMENT TYPE: Conference
LANGUAGE: English
AB We have achieved continuous photoprodn. of large vols. of H2 by down-regulating O2 evolution activity in algal cells (Ghirardi, et al. 2000a Trends in Biotechnol. 18: 506-511). This was accomplished by temporarily depleting the cells of sulfur (Melis, et al. 2000). Investigations are underway to simplify the system, accelerate the

transition to the H2-production mode upon sulfur depletion, and to determine the metabolic pathways involved in the process. Current year results include the observations that: (i) the rates of H2 production are not limited by the level of enzyme activity nor by the residual capacity of the algal cells to extract reductants from H2O but are directly related to the steady-state rate of photosynthetic electron transport, (ii) synchronization of the cultures by light/dark phases results in a higher total output of H2 but lower specific activity; and (iii) rigorous sulfur depletion and controlled sulfur re-addition increase the total amount of H2 produced, increase the specific rate of H2 production, and shorten the transition from the aerobic to the anaerobic, H2-production phase. We conclude that the used of light/dark growth cycles, as required for cultivation of algal cells under outdoor conditions does not have any adverse effects on subsequent H2 photoprodn. (under continuous illumination) when the cultures are re-supplemented with low concns. of sulfate. In fact, some results indicate increased yields of H2 gas upon re-addition of sulfate.

CC 10-6 (Microbial, Algal, and Fungal Biochemistry)
Section cross-reference(s): 9, 11, 16

IT **Chlamydomonas reinhardtii**
(cyclic photobiol. hydrogen-production by Chlamydomonas algae and effect of sulfur)

IT **1333-74-0P**, Hydrogen, biological studies
RL: BPN (Biosynthetic preparation); **BSU (Biological study, unclassified)**; FMU (Formation, unclassified); **BIOL (Biological study)**; FORM (Formation, nonpreparative); PREP (Preparation)
(cyclic photobiol. hydrogen-production by Chlamydomonas algae and effect of sulfur)

IT **7704-34-9**, Sulfur, biological studies
RL: **BSU (Biological study, unclassified)**; **BIOL (Biological study)**
(effect on hydrogen production; cyclic photobiol. hydrogen-production by Chlamydomonas algae and effect of sulfur)

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 18 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:537826 HCAPLUS
DOCUMENT NUMBER: 134:128136
TITLE: Development of synthetic multi-element reference material with pseudo-biological matrix and its application
AUTHOR(S): Iwata, Y.; Nakamura, A.
CORPORATE SOURCE: Dep. Chemistry, College Education, Akita Univ., Japan
SOURCE: JAERI-Review (2000), 2000-004, Kenkyuro Riyo ni okeru Kenkyu Seikashu, 328-333
CODEN: JERVE9
DOCUMENT TYPE: Report
LANGUAGE: English

AB A new type of synthetic multi-element reference material (SyRM) with pseudo-biol. matrix was prepared by copolymn. reaction of homogenate aqueous solution of acrylamide and acrylic acid containing know amount of the elements. SyRM has the excellent homogeneity and the quant. retention of major and trace elements. Elemental composition can simulate the biol. sample to be analyzed. SyRM can be used for same purpose of conventional certified reference material with high accuracy and precision. SyRM was applied as a comparative standard for non-destructive photon and α-particle activation anal. Selective preconcn. methods combined with NAA were proposed and the SyRM containing some fifty elements with known amts. was

prepared In order to evaluate of the reliability of present methods, 3d transition elements and rare earth elements in the SyRM were determined It was clearly observed that these methods have good accuracy and precision in trace anal. for biol. materials by comparing anal. results with the original contents in the SyRM. The SyRM supported multi-element anal. of marine macro-algae as comparative stds. and quality assurance of anal. techniques, and then 35 elements could be determined

CC 9-16 (Biochemical Methods)
Section cross-reference(s): 10, 11, 79

IT **Algae**
(**macro-, marine;** development of synthetic multi-element reference material with pseudo-biol. matrix and application)

IT **Marine algae**
(macro-; development of synthetic multi-element reference material with pseudo-biol. matrix and application)

IT **1333-74-0**, Hydrogen, analysis 7429-90-5, Aluminum, analysis 7429-91-6, Dysprosium, analysis 7439-89-6, Iron, analysis 7439-91-0, Lanthanum, analysis 7439-92-1, Lead, analysis 7439-94-3, Lutetium, analysis 7439-95-4, Magnesium, analysis 7439-96-5, Manganese, analysis 7439-97-6, Mercury, analysis 7440-00-8, Neodymium, analysis 7440-02-0, Nickel, analysis 7440-09-7, Potassium, analysis 7440-10-0, Praseodymium, analysis 7440-19-9, Samarium, analysis 7440-23-5, Sodium, analysis 7440-24-6, Strontium, analysis 7440-27-9, Terbium, analysis 7440-30-4, Thulium, analysis 7440-38-2, Arsenic, analysis 7440-43-9, Cadmium, analysis 7440-44-0, Carbon, analysis 7440-45-1, Cerium, analysis 7440-46-2, Cesium, analysis 7440-47-3, Chromium, analysis 7440-48-4, Cobalt, analysis 7440-50-8, Copper, analysis 7440-52-0, Erbium, analysis 7440-53-1, Europium, analysis 7440-54-2, Gadolinium, analysis 7440-60-0, Holmium, analysis 7440-61-1, Uranium, analysis 7440-62-2, Vanadium, analysis 7440-64-4, Ytterbium, analysis 7440-65-5, Yttrium, analysis 7440-66-6, Zinc, analysis 7440-70-2, Calcium, analysis 7553-56-2, Iodine, analysis **7704-34-9**, Sulfur, analysis 7723-14-0, Phosphorus, analysis 7726-95-6, Bromine element, analysis 7727-37-9, Nitrogen, analysis 7782-44-7, Oxygen, analysis 7782-49-2, Selenium, analysis 7782-50-5, Chlorine, analysis
RL: ANT (Analyte); ARU (Analytical role, unclassified); **BSU (Biological study, unclassified)**; ANST (Analytical study); **BIOL (Biological study)**
(development of synthetic multi-element reference material with pseudo-biol. matrix and application)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 19 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1999:549183 HCAPLUS
DOCUMENT NUMBER: 131:175120
TITLE: Micronutrient-dispensing device and method
INVENTOR(S): Dillon, Kenneth James
PATENT ASSIGNEE(S): USA
SOURCE: PCT Int. Appl., 22 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9942135	A1	19990826	WO 1999-US3570	19990222

W: DE, IN, RU
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE
PRIORITY APPLN. INFO.: US 1998-75532P P 19980223
AB A device for dispensing micronutrients is an alloy of essential minerals, of which the anodic ones are released by selective leaching via galvanic and other kinds of corrosion from a cathodic matrix. The invention can also be used to dispense vitamins and drugs. It provides a supplement to inadequate diets as well as prophylaxis against heavy metal pollution and therapy for certain nutritional deficiencies and conditions.
IC ICM A61K047-00
ICS A61K033-24; A61M035-00; A61F013-00; A44C005-00
CC 63-8 (Pharmaceuticals)
Section cross-reference(s): 18
IT **Seaweed**
(micronutrient-dispensing device)
IT **1333-74-0**, Hydrogen, biological studies 7439-89-6, Iron, biological studies 7439-95-4, Magnesium, biological studies 7439-96-5, Manganese, biological studies 7439-98-7, Molybdenum, biological studies 7440-02-0, Nickel, biological studies 7440-09-7, Potassium, biological studies 7440-21-3, Silicon, biological studies 7440-23-5, Sodium, biological studies 7440-31-5, Tin, biological studies 7440-44-0, Carbon, biological studies 7440-47-3, Chromium, biological studies 7440-48-4, Cobalt, biological studies 7440-50-8, Copper, biological studies 7440-62-2, Vanadium, biological studies 7440-66-6, Zinc, biological studies 7440-70-2, Calcium, biological studies 7553-56-2, Iodine, biological studies **7704-34-9**, Sulfur, biological studies 7723-14-0, Phosphorus, biological studies 7726-95-6, Bromine, biological studies 7727-37-9, Nitrogen, biological studies 7782-41-4, Fluorine, biological studies 7782-44-7, Oxygen, biological studies 7782-49-2, Selenium, biological studies 7782-50-5, Chlorine, biological studies
RL: DEV (Device component use); FFD (Food or feed use); THU (Therapeutic use); **BIOL (Biological study)**; USES (Uses)
(micronutrient-dispensing device)
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 20 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1996:131402 HCAPLUS
DOCUMENT NUMBER: 124:225689
TITLE: The design of culture media based on the elemental composition of biological material
AUTHOR(S): Spaargaren, Dirk H.
CORPORATE SOURCE: Netherlands Institute for Sea Research, P.O. Box 59, AB Den Burg, Texel, 1790, Neth.
SOURCE: Journal of Biotechnology (1996), 45(2), 97-102
CODEN: JBITD4; ISSN: 0168-1656
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
AB During growth, living organisms absorb chemical elements from their environment in ratios as they occur in their tissues. In lower organisms (microorganisms, plants), as well as in animal cell and tissue culture, the elements are absorbed as small mols. or as free ions, potentially affecting the relative ionic composition of their medium. To avoid these changes in the medium composition, the elements in culture media should be available in the same ratios as in which they occur in biol. material. This paper shows how, by using linear programming algorithms, culture media can be designed which approx. the average elemental composition of biol.

material. By mixing inorg. salts a culture medium can be prepared containing most of the major elements almost exactly in the ratios in which they occur in living material. Although certain deviations have to be allowed for the three most abundant elements (O, C, H), these can be justified by assuming that these elements will normally not act as limiting factors, as in an open system they can be supplemented by water and carbon dioxide from the air. With the addition of an organic compound, e.g., glucose, the average elementary composition of biol. material can even be matched exactly.

CC 9-11 (Biochemical Methods)
Section cross-reference(s): 10, 11, 13, 17

IT **Algae**
Algorithm
Animal tissue culture
Biological materials
Culture media
Microorganism
Plant tissue culture
(design of culture media based on elemental composition of biol. material)

IT 50-99-7, Glucose, biological studies 124-38-9, Carbon dioxide, biological studies 144-55-8, Sodium bicarbonate, biological studies 298-14-6, Potassium bicarbonate 497-19-8, Sodium carbonate, biological studies 584-08-7, Potassium carbonate 1066-33-7, Ammonium bicarbonate **1333-74-0**, Hydrogen, biological studies 6484-52-2, Ammonium nitrate, biological studies 6834-92-0 7429-90-5, Aluminum, biological studies 7439-89-6, Iron, biological studies 7439-95-4, Magnesium, biological studies 7440-09-7, Potassium, biological studies 7440-21-3, Silicon, biological studies 7440-23-5, Sodium, biological studies 7440-42-8, Boron, biological studies 7440-44-0, Carbon, biological studies 7440-50-8, Copper, biological studies 7440-66-6, Zinc, biological studies 7440-70-2, Calcium, biological studies 7447-40-7, Potassium chloride, biological studies 7487-88-9, Magnesium sulfate, biological studies 7558-79-4, Disodium phosphate 7558-80-7, Monosodium phosphate 7601-54-9, Trisodium phosphate 7631-99-4, Sodium nitrate, biological studies 7647-14-5, Sodium chloride, biological studies 7647-15-6, Sodium bromide, biological studies **7704-34-9**, Sulfur, biological studies 7720-78-7 7722-76-1, Ammonium dihydrogen phosphate 7723-14-0, Phosphorus, biological studies 7726-95-6, Bromine, biological studies 7727-37-9, Nitrogen, biological studies 7732-18-5, Water, biological studies 7733-02-0, Zinc sulfate 7757-79-1, Potassium nitrate, biological studies 7757-82-6, Sodium sulfate, biological studies 7758-11-4, Dipotassium phosphate 7758-98-7, Copper sulfate, biological studies 7778-53-2, Tripotassium phosphate 7778-77-0, Monopotassium phosphate 7778-80-5, Potassium sulfate, biological studies 7782-44-7, Oxygen, biological studies 7782-50-5, Chlorine, biological studies 7783-20-2, Ammonium sulfate, biological studies 7783-28-0, Ammonium hydrogen phosphate 10043-01-3, Aluminum sulfate 10043-52-4, Calcium chloride, biological studies 10124-37-5, Calcium nitrate 12125-02-9, Ammonium chloride, biological studies 16887-00-6, Chloride, biological studies 24959-67-9, Bromide, biological studies
RL: BOC (Biological occurrence); **BSU (Biological study, unclassified)**; BUU (Biological use, unclassified); **BIOL (Biological study)**; OCCU (Occurrence); USES (Uses)
(design of culture media based on elemental composition of biol. material)

L33 ANSWER 21 OF 54 ABI/INFORM COPYRIGHT 2005 ProQuest Information and Learning Company; All Rights Reserved on STN

ACCESSION NUMBER: 2004:97100 ABI-INFORM

DOCUMENT NUMBER: 641705951
TITLE: RENEWABLE **HYDROGEN** FROM GREEN **ALGAE**
AUTHOR: Ghirardi, Maria L; Amos, Wade
SOURCE: BioCycle: Publisher: Emmaus, (2004) Vol. 45, No. 5, pp. 59,62. Journal code: BIO; 26819. AVAILABILITY: YES CODEN: BCYCDK; ISSN: 0276-5055.
DOCUMENT TYPE: JOURNAL
TREATMENT CODE: PERIODICAL
LANGUAGE: English
ENTRY DATE: Entered STN: 20040818
Last Updated on STN: 20040818
WORD COUNT: 931

AB A few years ago, researchers at the University of California, Berkeley, and the National Renewable Energy Laboratory (NREL) discovered a physiological way to manipulate **algal** cultures to photoproduce **hydrogen** (**H2**) without the need to continuously remove oxygen (O2). This demonstration renewed interest in **algal** **H2** production as a possible future means to produce **H2** gas on a commercial basis. In order to estimate the economic potential of the **algal** **H2**-producing system and to identify key areas for research emphasis, NREL performed a cost analysis of the system. the analysis identified the following factors as being the major cost-drivers of the system: 1. low **H2** yield per g alga of the system; 2. long recovery time and the cost of cycling the cultures from **sulfur** replete to **sulfur deprived** conditions; and 3. high cost of the reactor material.

L33 ANSWER 22 OF 54 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN DUPLICATE 5
ACCESSION NUMBER: 2004:398653 BIOSIS
DOCUMENT NUMBER: PREV200400400768
TITLE: The photochemical activity of photosystem II in **sulfur-deprived Chlamydomonas reinhardtii** cells depends on the redox state of the quinone pool during the transition to anaerobiosis.
AUTHOR(S): Antal, T. K. [Reprint Author]; Krendeleva, T. E.; Rubin, A. B.
CORPORATE SOURCE: Dept Biol, Moscow MV Lomonosov State Univ, Vorobevy Gory, Moscow, 119899, Russia
SOURCE: Biofizika, (May 2004) Vol. 49, No. 3, pp. 499-505. print. CODEN: BIOFAI. ISSN: 0006-3029.
DOCUMENT TYPE: Article
LANGUAGE: Russian
ENTRY DATE: Entered STN: 13 Oct 2004
Last Updated on STN: 13 Oct 2004

AB Measurements with a PAM **fluorometer** showed that the photochemical activity of photosystem II (PS II) in **sulfur-deprived Chlamydomonas reinhardtii** cells (media TAP-S) decreases slowly under aerobic conditions. In a closed cultivator, when the rate of O2 photosynthetic evolution declines below the rate of respiration, the cell culture is under anaerobic conditions in which the activation of hydrogenase and the production of **hydrogen** take place. We found that the slow decrease in PS II activity is followed by an abrupt inactivation of PS II centers just after the onset of anaerobiosis. This fast PS II inactivation is reversed by aeration of the media and is accompanied by an increase in the **fluorescence** parameter Ft. Moreover, the rate of the abrupt PS II inactivation diminished after the addition into the medium of electron acceptors such as CO2 (carbonate-bicarbonate buffer), NO3- and SO42-, the assimilation of

which in chloroplasts requires a lot of reductants. We suggest that the PS II inactivation is due to the overreduction of the plastoquinone pool after the onset of anaerobiosis.

CC Biochemistry studies - Porphyrins and bile pigments 10065
Biophysics - Bioenergetics: electron transport and oxidative phosphorylation 10510
Plant physiology - Photosynthesis 51506

IT Major Concepts
Bioenergetics (Biochemistry and Molecular Biophysics)

IT Chemicals & Biochemicals
photosystem II: photochemical activity; quinone pool: redox state

IT Methods & Equipment
PAM **fluorometer**: laboratory equipment

IT Miscellaneous Descriptors
anaerobiosis

ORGN Classifier
Chlorophyta 13300
Super Taxa
Algae; Plantae
Organism Name
Chlamydomonas reinhardtii (species): **sulfur -deprived** cells
Taxa Notes
Algae, Microorganisms, Nonvascular Plants, Plants

L33 ANSWER 23 OF 54 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN DUPLICATE 8

ACCESSION NUMBER: 2004:68157 BIOSIS
DOCUMENT NUMBER: PREV200400068440
TITLE: The dependence of **algal H2** production on Photosystem II and O2 consumption activities in **sulfur-deprived Chlamydomonas reinhardtii** cells.
AUTHOR(S): Antal, T. K.; Krendeleva, T. E.; Laurinavichene, T. V.; Makarova, V. V.; Ghirardi, M. L.; Rubin, A. B.; Tsygankov, A. A.; Seibert, M. [Reprint Author]
CORPORATE SOURCE: Basic Sciences Center, National Renewable Energy Laboratory, 1617 Cole Boulevard, Golden, CO, 80401-3393, USA
mike_seibert@nrel.gov
SOURCE: Biochimica et Biophysica Acta, (8 December 2003) Vol. 1607, No. 2-3, pp. 153-160. print.
ISSN: 0006-3002 (ISSN print).
DOCUMENT TYPE: Article
LANGUAGE: English
ENTRY DATE: Entered STN: 28 Jan 2004
Last Updated on STN: 28 Jan 2004

AB **Chlamydomonas reinhardtii** cultures, **deprived** of inorganic **sulfur**, undergo dramatic changes during adaptation to the nutrient stress (Biotechnol. Bioeng. 78 (2002) 731). When the capacity for Photosystem II (PSII) O2 evolution decreases below that of respiration, the culture becomes anaerobic (Plant Physiol. 122 (2000) 127). We demonstrate that (a) the photochemical activity of PSII, monitored by in situ **fluorescence**, also decreases slowly during the aerobic period; (b) at the exact time of anaerobiosis, the remaining PSII activity is rapidly down regulated; and (c) electron transfer from PSII to PSI abruptly decreases at that point. Shortly thereafter, the PSII photochemical activity is partially restored, and **H2** production starts. **Hydrogen** production, which lasts for 3-4

days, is catalyzed by an anaerobically induced, reversible hydrogenase. While most of the reductants used directly for **H2** gas photoproduction come from water, the remaining electrons must come from endogenous substrate degradation through the NAD(P)H plastoquinone (PQ) oxido-reductase pathway. We propose that the induced hydrogenase activity provides a sink for electrons in the absence of other alternative pathways, and its operation allows the partial oxidation of intermediate photosynthetic carriers, including the PQ pool, between PSII and PSI. We conclude that the reduced state of this pool, which controls PSII photochemical activity, is one of the main factors regulating **H2** production under sulur-**deprived** conditions. Residual O2 evolved under these conditions is probably consumed mostly by the aerobic oxidation of storage products linked to mitochondrial respiratory processes involving both the cytochrome oxidase and the alternative oxidase. These functions maintain the intracellular anaerobic conditions required to keep the hydrogenase enzyme in the active, induced form.

CC Cytology - General 02502
Cytology - Plant 02504
Biochemistry studies - General 10060
Biochemistry studies - Porphyrins and bile pigments 10065
Nutrition - General studies, nutritional status and methods 13202
Plant physiology - Nutrition 51504
Plant physiology - Photosynthesis 51506
Plant physiology - Chemical constituents 51522

IT Major Concepts
Biochemistry and Molecular Biophysics; Cell Biology; Nutrition

IT Parts, Structures, & Systems of Organisms
photosystem II

IT Chemicals & Biochemicals
NAD(P)H plastoquinone; **sulfur**

IT Miscellaneous Descriptors
nutrient stress

ORGN Classifier
Chlorophyta 13300
Super Taxa
Algae; Plantae
Organism Name
Chlamydomonas reinhardtii (species)
Taxa Notes
Algae, Microorganisms, Nonvascular Plants, Plants

RN **7704-34-9** (**sulfur**)

L33 ANSWER 24 OF 54 IFIPAT COPYRIGHT 2005 IFI on STN DUPLICATE 2

AN 11000304 IFIPAT;IFIUDB;IFICDB

TITLE: **FLUORESCENCE** TECHNIQUE FOR ON-LINE MONITORING OF STATE OF **HYDROGEN**-PRODUCING MICROORGANISMS

INVENTOR(S): Makarova; Valeriya, Golden, CO, US
Rubin; Andrew B., Moscow, RU
Seibert; Michael, Lakewood, CO, US
Tsygankov; Anatoly A., Moscow, RU

PATENT ASSIGNEE(S): Unassigned

AGENT: PAUL J WHITE, SENIOR COUNSEL;NATIONAL RENEWABLE ENERGY LABORATORY (NREL), 1617 COLE BOULEVARD, GOLDEN, CO, 80401-3393, US

	NUMBER	PK	DATE
PATENT INFORMATION:	US 2005239044	A1	20051027

APPLICATION INFORMATION: US 2002-511929 20020419
WO 2002-US12576 20020419
20041018 PCT 371 date
20041018 PCT 102(e) date
FAMILY INFORMATION: US 2005239044 20051027
DOCUMENT TYPE: Utility
Patent Application - First Publication
FILE SEGMENT: CHEMICAL
APPLICATION

NUMBER OF CLAIMS: 16 7 Figure(s).
DESCRIPTION OF FIGURES:
FIG. 1 is a graph showing the effect of 10 mu M DCMU on the rate of **H2** photoproduction by cultures of **sulfur-depleted** C. reinhardtii cells, where the control cells are open circles and the DCMU-treated cells, are closed articles. DCMU was added to treated cells at the arrow. Time zero in this case represents the time after **H2** photoproduction starts.
FIG. 2 is a graph of a time course of physiological parameters and **H2** production in C. reinhardtii cells during incubation under **sulfur-** ***deprived*** conditions. More particularly,
FIG. 2A shows in situ **fluorescence** parameters Ft (open squares), Delta F/Fm' (solid circles),and Delta Fm' (open triangles) and ***chlorophyll*** concentrations (Chl; solid triangles) as a function of time, and
FIG. 2B shows dissolved oxygen (pO2, crosses), redox potential Eh (stars) and ***H2*** gas collected in an inverted graduate cylinder (solid squares). Incubation in **sulfur-deprived** medium started at 0 h.
FIG. 3 is a graph showing in situ **fluorescence** parameters Ft (open squares), Delta F/Fm' (solid circles), and Fm' (open triangles), as well as pO2 (crosses), Eh (stars) and **H2** content in the gas phase of culture vessel (solid squares) in illuminated, **sulfur-deprived**, C. reinhardtii during the transition of the **algae** from aerobic to anaerobic conditions. Incubation in **sulfur-deprived** medium started at 0 h.
FIG. 4 is a graph showing changes in **chlorophyll fluorescence** parameters recorded in a dark-adapted **algal** sample, which was removed anaerobically from a culture vessel 22 hours after the beginning of **H2** production. After 18 minutes of dark adaptation, the **algal** sample was aerated (arrow). F0 (open squares), Fm (open triangles), and Fv/Fm (solid circles) were monitored periodically as a function of time after removal from the culture vessel.
FIG. 5 is a graph showing **chlorophyll fluorescence** induction curves in control **algae** at the start of **sulfur** ***deprivation*** (A) and in cells removed from a culture vessel anaerobically after 22 hours of **H2** production (B, C, D). (B) ***Fluorescence*** kinetics were recorded while the cells were illuminated with saturating light after a 10-minute period of dark adaptation. (C) Same as (B) except far red light (lambda 735 nm) was turned on for one second prior to the measurement. (D) Same as (B) except that the sample was aerated just prior to measurement. The F0 level occurs at time zero.

AB In situ **fluorescence** method to monitor state of **sulfur -deprived algal** culture's ability to produce **H2** under **sulfur depletion**, comprising: a) providing **sulfur-deprived algal** culture; b) illuminating culture; c) measuring onset of **H2** percentage in produced gas phase at multiple times to ascertain point immediately after anerobiosis to obtain **H2** data as function of time; and d) determining any abrupt change in three in situ **fluorescence**

parameters; i) increase in Ft (steady-state level of **chlorophyll fluorescence** in light adapted cells); ii) decrease in Fm, (maximal saturating light induced **fluorescence** level in light adapted cells); and iii) decrease in Delta F/ Fm'=(Fm'-Ft)/Fm' (calculated photochemical activity of photosystem II (PSII) signaling full reduction of plastoquinone pool between PSII and PSI, which indicates start of anaerobic conditions that induces synthesis of hydrogenase enzyme for subsequent **H2** production that signal oxidation of plastoquinone pool asmain factor to regulate **H2** under **sulfur depletion.**

CLMN 16 7 Figure(s).

FIG. 1 is a graph showing the effect of 10 mu M DCMU on the rate of **H2** photoproduction by cultures of **sulfur-depleted** C. reinhardtii cells, where the control cells are open circles and the DCMU-treated cells, are closed articles. DCMU was added to treated cells at the arrow. Time zero in this case represents the time after **H2** photoproduction starts.

FIG. 2 is a graph of a time course of physiological parameters and **H2** production in C. reinhardtii cells during incubation under **sulfur-deprived** conditions. More particularly,

FIG. 2A shows in situ **fluorescence** parameters Ft (open squares), Delta F/Fm' (solid circles),and Delta Fm' (open triangles) and **chlorophyll** concentrations (Chl; solid triangles) as a function of time, and

FIG. 2B shows dissolved oxygen (pO2, crosses), redox potential Eh (stars) and **H2** gas collected in an inverted graduate cylinder (solid squares). Incubation in **sulfur-deprived** medium started at 0 h.

FIG. 3 is a graph showing in situ **fluorescence** parameters Ft (open squares), Delta F/Fm' (solid circles), and Fm' (open triangles), as well as pO2 (crosses), Eh (stars) and **H2** content in the gas phase of culture vessel (solid squares) in illuminated, **sulfur-deprived**, C. reinhardtii during the transition of the **algae** from aerobic to anaerobic conditions. Incubation in **sulfur-deprived** medium started at 0 h.

FIG. 4 is a graph showing changes in **chlorophyll fluorescence** parameters recorded in a dark-adapted **algal** sample, which was removed anaerobically from a culture vessel 22 hours after the beginning of **H2** production. After 18 minutes of dark adaptation, the **algal** sample was aerated (arrow). F0 (open squares), Fm (open triangles), and Fv/Fm (solid circles) were monitored periodically as a function of time after removal from the culture vessel.

FIG. 5 is a graph showing **chlorophyll fluorescence** induction curves in control **algae** at the start of **sulfur deprivation** (A) and in cells removed from a culture vessel anaerobically after 22 hours of **H2** production (B, C, D). (B) **Fluorescence** kinetics were recorded while the cells were illuminated with saturating light after a 10-minute period of dark adaptation. (C) Same as (B) except far red light (lambda 735 nm) was turned on for one second prior to the measurement. (D) Same as (B) except that the sample was aerated just prior to measurement. The F0 level occurs at time zero.

L33 ANSWER 25 OF 54 IFIPAT COPYRIGHT 2005 IFI on STN
AN 01291511 IFIPAT;IFIUDB;IFICDB
TITLE: METHOD OF CONTROLLING AQUATIC WEEDS AND **ALGAE** ; USING 3-PHENYL-4(1H)-PYRIDONES OR PYRIDINETHIONES
INVENTOR(S): Taylor, Harold M, Indianapolis, IN
PATENT ASSIGNEE(S): Eli Lilly and Company, Indianapolis, IN

PRIMARY EXAMINER: Mills, Catherine L
AGENT: Jones, Joseph A
Whale, Arthur R

	NUMBER	PK	DATE
PATENT INFORMATION:	US 4235619	A	19801125
	(CITED IN 003 LATER PATENTS)		
APPLICATION INFORMATION:	US 1979-21670		19790319
EXPIRATION DATE:	25 Nov 1997		

	APPLN. NUMBER	DATE	GRANTED PATENT NO. OR STATUS
CONTINUATION-IN-PART OF:	US 1974-501424	19740828	ABANDONED
CONTINUATION-IN-PART OF:	US 1975-591661	19750703	ABANDONED
CONTINUATION-IN-PART OF:	US 1977-810219	19770627	4152136
FAMILY INFORMATION:	US 4235619	19801125	
	US 4152136		

DOCUMENT TYPE: Utility
FILE SEGMENT: CHEMICAL
GRANTED
OTHER SOURCE: CA 95:19710

NUMBER OF CLAIMS: 44

AB A method of reducing the vigor of aquatic weeds and **algae** makes use of a class of 3-phenyl-4(1H)-pyridones and pyridinethiones. The new compounds are characterized by a methyl group on the nitrogen, and usually bear a 5-substituent chosen from a class which is described herein. The phenyl ring may be substituted. The compounds effectively control aquatic weeds and **algae**, and kill the plants slowly, so that their decomposition does not **deplete** oxygen in the treated body of water.

CLMN 44

L33 ANSWER 26 OF 54 MEDLINE on STN
ACCESSION NUMBER: 2002086455 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11813546
TITLE: The relationship between the photosystem 2 activity and **hydrogen** production in **sulfur deprived Chlamydomonas reinhardtii** cells.
AUTHOR: Antal T K; Krendeleva T E; Laurinavichene T V; Makarova V V; Tsygankov A A; Seibert M; Rubin A B
CORPORATE SOURCE: Biological Faculty, Moscow State University, Vorob'evy gory, Moscow, 119899 Russia.
SOURCE: Doklady. Biochemistry and biophysics, (2001 Nov-Dec) 381 371-4.
Journal code: 101126895. ISSN: 1607-6729.
PUB. COUNTRY: Russia: Russian Federation
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200208
ENTRY DATE: Entered STN: 20020130
Last Updated on STN: 20020814
Entered Medline: 20020813
CT Anaerobiosis: PH, physiology
Animals

***Chlamydomonas reinhardtii: ME, metabolism**
Chlamydomonas reinhardtii: PH, physiology
***Hydrogen: ME, metabolism**
Kinetics
*Photosynthetic Reaction Center Complex Proteins: ME, metabolism
Research Support, Non-U.S. Gov't
Spectrometry, Fluorescence
***Sulfur: DF, deficiency**
RN **1333-74-0 (Hydrogen); 7704-34-9 (Sulfur)**
CN 0 (Photosynthetic Reaction Center Complex Proteins)

L33 ANSWER 27 OF 54 COPYRIGHT 2005 Gale Group on STN

ACCESSION NUMBER: 1999:22127 NLDB
TITLE: 1998 FOOD ADDITIVE SUMMARY.
SOURCE: Food Chemical News, (25 Jan 1999) Vol. 40, No. 49. ISSN: 0015-6337.
PUBLISHER: Food Chemical News, Inc.
DOCUMENT TYPE: Newsletter
LANGUAGE: English
WORD COUNT: 20496

L33 ANSWER 28 OF 54 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN DUPLICATE 3
ACCESSION NUMBER: 2005-372127 [38] WPIX
DOC. NO. CPI: C2005-115184
TITLE: Use of sequential chemostat culture vessels (where photosynthetic oxygen gas evolution and **hydrogen** photoproduction are separated physically into two separate bioreactors), for producing continuous **hydrogen** gas.
DERWENT CLASS: D16 E36
INVENTOR(S): GHIRARDI, M L; KOSOUROV, S; SEIBERT, M
PATENT ASSIGNEE(S): (MIDE) MIDWEST RES INST
COUNTRY COUNT: 106
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 2005042694	A2	20050512	(200538)*	EN	23
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS LU MC MW MZ NL OA PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW					
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW					
AU 2003282895	A1	20050519	(200551)		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2005042694	A2	WO 2003-US30992	20031001
AU 2003282895	A1	AU 2003-282895	20031001
		WO 2003-US30992	20031001

FILING DETAILS:

PATENT NO	KIND	PATENT NO

AU 2003282895 A1 Based on WO 2005042694

PRIORITY APPLN. INFO: WO 2003-US30992 20031001
AN 2005-372127 [38] WPIX
AB WO2005042694 A UPAB: 20050616
NOVELTY - Method of using sequential chemostat culture vessels (I) to provide continuous **hydrogen** gas production, in which photosynthetic oxygen gas evolution and **hydrogen** photoproduction are separated physically into two separate bioreactors.
DETAILED DESCRIPTION - Method of using sequential chemostat culture vessels (I) to provide continuous **hydrogen** gas production, in which photosynthetic oxygen gas evolution and **hydrogen** photoproduction are separated physically into two separate bioreactors (a) comprising growing a microorganism culture able to continuously generate **hydrogen** by photosynthetically producing cells at about the early-to-late log state in a first photobioreactor (1) operating as a **sulfur** chemostat under aerobic and/or anaerobic conditions, continuously feeding cells from (1) to a second photobioreactor (2) operating under anaerobic conditions and **sulfur deprivation** conditions resulting from constant uptake of sulfate in the first (a) and a low rate of culture flow between the first and second (a), to induce hydrogenase and **hydrogen** photoproduction to provide continuous cultivation of the microorganism's cells in (1) and constant **hydrogen** gas production in (2) and collecting the **hydrogen** gas from (2).
USE - (I) Is useful for continuous production of **hydrogen** gas (claimed).
ADVANTAGE - The yield of the continuous system is comparable or better than that of the batch system with substantially lower cost due to the elimination of many centrifugation steps. The **algal hydrogen** gas production is stable for at least 14 days.
Dwg.0/8

L33 ANSWER 29 OF 54 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN DUPLICATE 4
ACCESSION NUMBER: 2005-081920 [09] WPIX
DOC. NO. NON-CPI: N2005-071922
DOC. NO. CPI: C2005-028526
TITLE: Producing **hydrogen** involves culturing photosynthetic microorganism having respiratory electron transfer chain capacity including oxidative phosphorylation pathway, under microoxic and illuminated condition.
DERWENT CLASS: D16 E19 E36 X16
INVENTOR(S): HANKAMER, B; KRUSE, O
PATENT ASSIGNEE(S): (UYQU) UNIV QUEENSLAND
COUNTRY COUNT: 108
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 2005003024	A1	20050113	(200509)*	EN	76

RW: AT BE BG BW CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS LU MC MW MZ NA NL OA PL PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2005003024	A1	WO 2004-AU913	20040707

PRIORITY APPLN. INFO: AU 2003-903453 20030707
AN 2005-081920 [09] WPIX
AB WO2005003024 A UPAB: 20050207
NOVELTY - Producing (M1) **hydrogen** comprising culturing photosynthetic microorganism (I) under microoxic and illuminated conditions, and collecting evolved **hydrogen**. (I) Has respiratory electron transfer chain (C1) that includes oxidative phosphorylation pathway (P1), and expresses hydrogenase. The regulation of (P1) is disrupted with result that electron flow along (C1) toward cytochrome oxidase (complex IV) is reduced, is new.

DETAILED DESCRIPTION - Production (M1) of **hydrogen** involves culturing a photosynthetic microorganism (I) under microoxic and illuminated conditions; and collecting evolved **hydrogen**. (I) Has electron transfer capability through a photosynthetic light reaction pathway and through a respiratory electron transfer chain (C1) that includes oxidative phosphorylation pathway (P1), and that expresses hydrogenase. The regulation of (P1) is disrupted with the result that electron flow along (C1) toward cytochrome oxidase (complex IV) is reduced.

INDEPENDENT CLAIMS are also included for:

(1) enhancing (M2) biomass production involving: culturing the photosynthetic microorganism under illuminated conditions and in the presence of a carbon source in order to expand the biomass;

(2) sequestering carbon from an external nutrient supply involving: providing photosynthetic microorganism having electron transfer capability through a photosynthetic light reaction including photosystem I and II (PS I and II) and which expresses a hydrogenase, where regulation of oxidative phosphorylation is disrupted so as to reduce or eliminate inherent oxygen inhibition of the hydrogenase; culturing the microorganism under illuminated conditions to expand biomass, where the external nutrient supply (preferably a waste stream) is employed as a carbon source for the culture and is **depleted** of carbon; and

(3) a pure culture of (I).

USE - The method is useful for producing **hydrogen** (claimed).

ADVANTAGE - The method is sustainable and efficient process for production of **hydrogen** that avoids **sulfur deprivation**. The disruption of regulation of oxidative phosphorylation pathway in mitochondria increases starch levels in the chloroplast; inhibits photosynthetic cyclic electron transfer; reduces oxygen production by PSII and hence allows operation of hydrogenase with reduced inherent oxygen inhibition.

Dwg.0/16

L33 ANSWER 30 OF 54 EPFULL COPYRIGHT 2005 EPO/FIZ KA on STN

ACCESSION NUMBER: 2004:141888 EPFULL
ENTRY DATE PATENT: 20050831
ENTRY DATE PUBLICATION: 20050831
UPDATE DATE PUBLICAT.: 20051019
DATA UPDATE DATE: 20051019

DATA UPDATE WEEK: 200542
TITLE (ENGLISH): Sequence-determined DNA fragments and corresponding polypeptides encoded thereby
TITLE (FRENCH): Fragments d'ADN avec des sequences determinees et polypeptides encodees par lesdits fragments
TITLE (GERMAN): DNA-Fragmente mit bestimmter Sequenz und die dadurch kodierte Polypeptide
INVENTOR(S): Alexandrov, Nickolai, 1404 Oak Trail Street, Thousand Oaks, CA 91320, US; Brover, Vyacheslav, 1741 N. Warfield Circle, Simi Valley, CA 93063, US; Chen, Xianfeng, 1705 S. Westgate Avenue, no. 2, Los Angeles, CA 90025, US; Subramanian, Gopalkrishan, 4205 Peach Slope Road, Moorpark, CA 93021, US; Troukhan, Maxim E., 29425 Hillrise Drive, Agoura Hills, CA 91301, US; Zheng, Liansheng, 19212 Circle Gate Drive, no. 201, Germantown, MD 20874, US; Dumas, J., 8 rue de Gregoire-de-Tours, Paris, FR
PATENT APPLICANT(S): Ceres Incorporated, 3007 Malibu Canyon Road, Malibu, CA 90265, US
PATENT APPL. NUMBER: 2967260
AGENT: Elsy, David, et al, Withers & Rogers LLP Goldings House, 2 Hays Lane, London SE1 2HW, GB
AGENT NUMBER: 94121
LANGUAGE OF FILING: English
LANGUAGE OF PUBL.: English
LANGUAGE OF PROCEDURE: English
LANGUAGE OF TITLE: German; English; French
DOCUMENT TYPE: Patent
PATENT INFO TYPE: EPA2 Application published without search report
PATENT INFORMATION:

NUMBER	KIND	DATE	
EP 1586645	A2	20051019	

DESIGNATED STATES: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

APPLICATION INFO.:	EP 2004-17692	A 20000225	
RELATED DOC. INFO.:	EP 2000-301439	20000225	EP 1033405 Parent Application
PRIORITY INFO.:	US 1999-121825P	P 19990225	
	US 1999-123180P	P 19990305	
	US 1999-123548P	P 19990309	
	US 1999-125788P	P 19990323	
	US 1999-126264P	P 19990325	
	US 1999-126785P	P 19990329	
	US 1999-127462P	P 19990401	
	US 1999-129845P	P 19990416	
	US 1999-130077P	P 19990419	
	US 1999-130449P	P 19990421	
	US 1999-130891P	P 19990423	
	US 1999-130510P	P 19990423	
	US 1999-132407P	P 19990430	
	US 1999-132484P	P 19990504	
	US 1999-132485P	P 19990505	
	US 1999-132863P	P 19990507	
	US 1999-134256P	P 19990511	
	US 1999-134218P	P 19990514	
	US 1999-134219P	P 19990514	
	US 1999-139452P	P 19990616	
	US 1999-139453P	P 19990616	

US 1999-139461P	P	19990618
US 1999-139463P	P	19990618
US 1999-139457P	P	19990618
US 1999-139459P	P	19990618
US 1999-139462P	P	19990618
US 1999-139455P	P	19990618
US 1999-139458P	P	19990618
US 1999-139454P	P	19990618
US 1999-139456P	P	19990618
US 1999-139460P	P	19990618
US 1999-144085P	P	19990716
US 1999-144086P	P	19990716
US 1999-144333P	P	19990719
US 1999-144335P	P	19990719
US 1999-144334P	P	19990719
US 1999-144884P	P	19990720
US 1999-144352P	P	19990720
US 1999-145145P	P	19990723
US 1999-145224P	P	19990723
US 1999-145919P	P	19990727
US 1999-145918P	P	19990727
US 1999-146388P	P	19990802
US 1999-146389P	P	19990802
US 1999-147302P	P	19990804
US 1999-147192P	P	19990805
US 1999-147303P	P	19990806
US 1999-147935P	P	19990809
US 1999-148171P	P	19990810
US 1999-148684P	P	19990813
US 1999-149368P	P	19990816
US 1999-149929P	P	19990820
US 1999-149930P	P	19990823
US 1999-132486P	P	19990506
US 1999-144332P	P	19990719
US 1999-144331P	P	19990719
US 1999-145086P	P	19990721
US 1999-145088P	P	19990721
US 1999-145085P	P	19990722
US 1999-145089P	P	19990722
US 1999-145087P	P	19990722

ABEN

The present invention provides DNA molecules that constitute fragments of the genome of a plant, and polypeptides encoded thereby. The DNA molecules are useful for specifying a gene product in cells, either as a promoter or as a protein coding sequence or as an UTR or as a 3' termination sequence, and are also useful in controlling the behavior of a gene in the chromosome, in controlling the expression of a gene or as tools for genetic mapping, recognizing or isolating identical or related DNA fragments, or identification of a particular individual organism, or for clustering of a group of organisms with a common trait.

L33 ANSWER 31 OF 54 EPFULL COPYRIGHT 2005 EPO/FIZ KA on STN

ACCESSION NUMBER: 2000:5260 EPFULL
DATA UPDATE DATE: 20010801
DATA UPDATE WEEK: 200131
TITLE (ENGLISH): Sequence-determined DNA fragments and corresponding polypeptides encoded thereby

TITLE (FRENCH): Fragments d'ADN avec des sequences determinees et polypeptides encodees par lesdits fragments

TITLE (GERMAN): DNS-fragmente mit bestimmter Sequenz und die dadurch kodierte Polypeptide

INVENTOR(S): Alexandrov, Nickolai, 1404 Oak Trail Street, Thousand Oaks, CA 91320, US; Brover, Vyacheslav, 5916 N. Las Virgenes Road, no. 590, Calabasas, CA 91302, US; Chen, Xianfeng, 1705 S. Westgate Avenue, no. 2, Los Angeles, CA 90025, US; Subramanian, Gopalakrishnan, 4205 Peach Slope Road, Moorpark, CA 93021, US; Troukhan, Maxim E., 1675 Amberwood Drive, no. 2, South Pasadena, CA 91030, US; Zheng, Liansheng, 12333 Wild Turkey Court, #B, Creve Coeur, MO 63141, US; Dumas, J., 8 rue de Gregoire-de-tours, Paris, FR

PATENT APPLICANT(S): Ceres Incorporated, 3007 Malibu Canyon Road, Malibu, CA 90265, US

PATENT APPL. NUMBER: 2967260

AGENT: Bannerman, David Gardner, et al, Withers & Rogers, Goldings House, 2 Hays Lane, London SE1 2HW, GB

AGENT NUMBER: 28001

DOCUMENT TYPE: Patent

LANGUAGE OF FILING: English

LANGUAGE OF PUBL.: English

LANGUAGE OF PROCEDURE: English

LANGUAGE OF TITLE: German; English; French

PATENT INFO TYPE: EPA3 Separate publication of search report

PATENT INFORMATION:

NUMBER	KIND	DATE
EP 1033405	A3	20010801

DESIGNATED STATES: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

EXTENSION STATES: AL LT LV MK RO SI

APPLICATION INFO.:	EP 2000-301439	A	20000225
PRIORITY INFO.:	US 1999-121825P	P	19990225
	US 1999-145918P	P	19990727
	US 1999-146388P	P	19990802
	US 1999-146389P	P	19990802
	US 1999-147302P	P	19990804
	US 1999-147192P	P	19990805
	US 1999-147303P	P	19990806
	US 1999-147935P	P	19990809
	US 1999-148171P	P	19990810
	US 1999-148684P	P	19990813
	US 1999-149368P	P	19990816
	US 1999-149929P	P	19990820
	US 1999-149930P	P	19990823
	US 1999-151065P	P	19990827
	US 1999-151066P	P	19990827
	US 1999-159294P	P	19991013
	US 1999-159295P	P	19991013
	US 1999-159293P	P	19991013
	US 1999-159638P	P	19991014
	US 1999-159637P	P	19991014
	US 1999-159329P	P	19991014
	US 1999-159331P	P	19991014
	US 1999-159330P	P	19991014
	US 1999-164260P	P	19991109
	US 1999-164259P	P	19991109

US 1999-164317P	P	19991110
US 1999-164321P	P	19991110
US 1999-164318P	P	19991110
US 1999-164319P	P	19991110
US 1999-167362P	P	19991123
US 1999-167382P	P	19991124
US 1999-169692P	P	19991208
US 1999-169691P	P	19991208
US 2000-176866P	P	20000119
US 2000-176867P	P	20000119
US 2000-176910P	P	20000119
US 2000-178166P	P	20000126
US 2000-178546P	P	20000127
US 2000-178544P	P	20000127
US 2000-178545P	P	20000127
US 1999-123180P	P	19990305
US 1999-123548P	P	19990309
US 1999-125788P	P	19990323
US 1999-126264P	P	19990325
US 1999-126785P	P	19990329
US 1999-127462P	P	19990401
US 1999-128234P	P	19990406
US 1999-128714P	P	19990408
US 1999-129845P	P	19990416
US 1999-130077P	P	19990419
US 1999-130449P	P	19990421
US 1999-130891P	P	19990423
US 1999-130510P	P	19990423
US 1999-131449P	P	19990428
US 1999-132407P	P	19990430
US 1999-132048P	P	19990430
US 1999-132484P	P	19990504
US 1999-132485P	P	19990505
US 1999-132487P	P	19990506
US 1999-132486P	P	19990506
US 1999-132863P	P	19990507
US 1999-134256P	P	19990511
US 1999-134221P	P	19990514
US 1999-134218P	P	19990514
US 1999-134219P	P	19990514
US 1999-139452P	P	19990616
US 1999-139453P	P	19990616
US 1999-139461P	P	19990618
US 1999-139463P	P	19990618
US 1999-139457P	P	19990618
US 1999-139459P	P	19990618
US 1999-139462P	P	19990618
US 1999-139455P	P	19990618
US 1999-139458P	P	19990618
US 1999-139454P	P	19990618
US 1999-139456P	P	19990618
US 1999-139460P	P	19990618
US 1999-144085P	P	19990716
US 1999-144086P	P	19990716
US 1999-144333P	P	19990719
US 1999-144335P	P	19990719
US 1999-144334P	P	19990719
US 1999-144332P	P	19990719
US 1999-144331P	P	19990719

US 1999-144884P	P	19990720
US 1999-144352P	P	19990720
US 1999-145086P	P	19990721
US 1999-145088P	P	19990721
US 1999-145085P	P	19990722
US 1999-145089P	P	19990722
US 1999-145087P	P	19990722
US 1999-145145P	P	19990723
US 1999-145224P	P	19990723
US 1999-145919P	P	19990727

L33 ANSWER 32 OF 54 EPFULL COPYRIGHT 2005 EPO/FIZ KA on STN

ACCESSION NUMBER:	2000:36519 EPFULL
DATA UPDATE DATE:	20010117
DATA UPDATE WEEK:	200103
TITLE (ENGLISH):	Sequence-determined DNA fragments and corresponding polypeptides encoded thereby
TITLE (FRENCH):	Fragments d'ADN avec des sequences determinees et polypeptides encodees par lesdits fragments
TITLE (GERMAN):	DNS-fragmente mit bestimmter Sequenz und die dadurch kodierte Polypeptide
INVENTOR(S):	Alexandrov, Nickolai, 1404 Oak Trail St., Thousand Oaks, CA 91320, US; Troukhan, Maxim E., 1675 Amberwood Dr. No. 2, South Pasadena, CA 91030, US
PATENT APPLICANT(S):	Ceres Incorporated, 3007 Malibu Canyon Road, Malibu, CA 90265, US
PATENT APPL. NUMBER:	2967260
AGENT:	Bannerman, David Gardner, et al, Withers & Rogers, Goldings House, 2 Hays Lane, London SE1 2HW, GB
AGENT NUMBER:	28001
LANGUAGE OF FILING:	English
LANGUAGE OF PUBL.:	English
LANGUAGE OF PROCEDURE:	English
LANGUAGE OF TITLE:	German; English; French
DOCUMENT TYPE:	Patent
PATENT INFO TYPE:	EPA2 Application published without search report
PATENT INFORMATION:	

NUMBER	KIND	DATE
EP 1059354	A2	20001213

DESIGNATED STATES:	AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
EXTENSION STATES:	AL LT LV MK RO SI
APPLICATION INFO.:	EP 2000-304943 A 20000612
PRIORITY INFO.:	US 1999-138540P P 19990610
	US 1999-138847P P 19990610

ABEN

The present invention provides DNA molecules that constitute fragments of the genome of a plant, and polypeptides encoded thereby. The DNA molecules are useful for specifying a gene product in cells, either as a promoter or as a protein coding sequence or as an UTR or as a 3' termination sequence, and are also useful in controlling the behavior of a gene in the chromosome, in controlling the expression of a gene or as tools for genetic mapping, recognizing or isolating identical or related DNA fragments, or identification of a particular individual organism, or for clustering of a group of organisms with a common trait.

L33 ANSWER 33 OF 54 PCTFULL COPYRIGHT 2005 Univentio on STN
ACCESSION NUMBER: 2005072254 PCTFULL ED 20050816 EW 200532
TITLE (ENGLISH): MODULATION OF SULFATE PERMEASE FOR PHOTOSYNTHETIC **HYDROGEN** PRODUCTION
TITLE (FRENCH): MODULATION DE SULFATE PERMEASE POUR LA PRODUCTION PHOTOSYNTHETIQUE D'HYDROGENE
INVENTOR(S): MELIS, Anastasios, 2745 Del Monte Avenue, El Cerrito, CA 94530-1507, US [US, US];
WINTZ, Hsu-Ching Chen, 6483 Conlon Avenue, El Cerrito, CA 94530, US [FR, US]
PATENT ASSIGNEE(S): THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, 1111 Franklin Street, 12th Floor, Oakland, CA 94607-5200, US [US, US], for all designates States except US;
MELIS, Anastasios, 2745 Del Monte Avenue, El Cerrito, CA 94530-1507, US [US, US], for US only;
WINTZ, Hsu-Ching Chen, 6483 Conlon Avenue, El Cerrito, CA 94530, US [FR, US], for US only
AGENT: BOZICEVIC, Karl$, Bozicevic, Field & Francis LLP, 1900 University Avenue, Suite 200, East Palo Alto, CA 94303$, US
LANGUAGE OF FILING: English
LANGUAGE OF PUBL.: English
DOCUMENT TYPE: Patent
PATENT INFORMATION:

NUMBER	KIND	DATE
WO 2005072254	A2	20050811

DESIGNATED STATES
W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
RW (ARIPO): BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW
RW (EAPO): AM AZ BY KG KZ MD RU TJ TM
RW (EPO): AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LT LU MC NL PL PT RO SE SI SK TR
RW (OAPI): BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
APPLICATION INFO.: WO 2005-US1937 A 20050121
PRIORITY INFO.: US 2004-10/762,769 20040121

ABEN Sustained **hydrogen** production is obtained by the culturing of a genetically-modified **algae**, where the ability of the chloroplasts to intake sulfate is reduced or eliminated compared to wild-type **algae**. The alga is cultured in a sealed environment in a liquid or solid medium that contains sulfur, and **hydrogen** is generated continuously. Alternatively, the **algae** may be cultured in the presence of bacteria that also produce **hydrogen** gas. The **hydrogen** produced can be collected and used as a clean energy source.

ABFR Selon l'invention, la production soutenue d'hydrogene est obtenue par culture d'une algue genetiquement modifiee, selon laquelle l'aptitude des chloroplastes a assimiler du sulfate est reduite ou eliminee en comparaison avec une algue de type sauvage. L'algue est cultivee dans un environnement ferme dans un milieu liquide ou solide qui contient du soufre, et l'hydrogene est genere en continu. En variante, l'algue peut etre cultivee en presence de bacteries qui produisent egalement de l'hydrogene sous forme de gaz. L'hydrogene produit peut etre collecte et utilise en tant que source d'energie propre.

L33 ANSWER 34 OF 54 PCTFULL COPYRIGHT 2005 Univentio on STN
ACCESSION NUMBER: 2004094590 PCTFULL ED 20041110 EW 200445
TITLE (ENGLISH): SYNTHETIC GENES FOR PLANT GUMS AND OTHER HYDROXYPROLINE-RICH GLYCOPROTEINS
TITLE (FRENCH): GENES SYNTHETIQUES POUR GOMMES VEGETALES ET AUTRES GLYCOPROTEINES RICHES EN HYDROXYPROLINE
INVENTOR(S): KIELISZEWSKI, Marcia, J., 5251 Raymar Drive, Albany, OH 45701, US [US, US]
PATENT ASSIGNEE(S): OHIO UNIVERSITY, Technology Transfer Office, Unit 14, 340 West State Street, Athens, OH 45701, US [US, US], for all designates States except US;
KIELISZEWSKI, Marcia, J., 5251 Raymar Drive, Albany, OH 45701, US [US, US], for US only
AGENT: MYERS-PAYNE, Sean, C.$, Calfee, Halter & Griswold LLP, 21 East State Street, 1100 Fifth Third Center, Columbus, OH 43215$, US
LANGUAGE OF FILING: English
LANGUAGE OF PUBL.: English
DOCUMENT TYPE: Patent
PATENT INFORMATION:

NUMBER	KIND	DATE
WO 2004094590	A2	20041104

DESIGNATED STATES
W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
RW (ARIPO): BW GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
RW (EAPO): AM AZ BY KG KZ MD RU TJ TM
RW (EPO): AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO SE SI SK TR
RW (OAPI): BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
APPLICATION INFO.: WO 2004-US11174 A 20040413
PRIORITY INFO.: US 2003-10/418,032 20030416

ABEN A new approach in the field of plant gums is described which presents a new solution to the production of hydroxyproline(Hyp)-rich glycoproteins (HRGPs), repetitive proline-rich proteins (RPRPs) and arabinogalactan-proteins (AGPs). The expression of synthetic genes designed from repetitive peptide sequences of such glycoproteins, including the peptide sequences of gum arabic glycoprotein (GAGP), is taught in host cells, including plant host cells.

ABFR L'invention concerne une nouvelle approche dans le domaine des gommes vegetales qui apporte une nouvelle solution pour produire des glycoproteines riches en hydroxyproline (Hyp) (HRGP), des proteines repetitives riches en proline (RPRP) et des arabinogalactane-proteines (AGP). L'invention concerne egalement l'expression de genes synthetiques concus a partir de sequences peptidiques repetitives de ce type de glycoproteines, notamment les sequences peptidiques de la glycoproteine de gomme arabique (GAGP), dans des cellules hotes, notamment des cellules hotes vegetales.

L33 ANSWER 35 OF 54 PCTFULL COPYRIGHT 2005 Univentio on STN
ACCESSION NUMBER: 2004093524 PCTFULL ED 20041110 EW 200445
TITLE (ENGLISH): OXYGEN-RESISTANT HYDROGENASES AND METHODS FOR DESIGNING AND MAKING SAME

TITLE (FRENCH): HYDROGENASES RESISTANT A L'OXYGENE ET PROCEDES CORRESPONDANTS DE CONCEPTION ET DE REALISATION

INVENTOR(S): KING, Paul, 1919 Denver West Drive, Apt. 122B, Golden, Colorado 80403, US [US, US];
GHIRARDI, Maria, L, 111354 20th Avenue, Lakewood, Colorado 80215, US [US, US];
SEIBERT, Michael, 13134 Yale Place, Lakewood, Colorado 80228, US [US, US]

PATENT ASSIGNEE(S): MIDWEST RESEARCH INSTITUTE, 425 Volker Boulevard, Kansas City, Missouri 64110, US [US, US], for all designates States except US;
KING, Paul, 1919 Denver West Drive, Apt. 122B, Golden, Colorado 80403, US [US, US], for US only;
GHIRARDI, Maria, L, 111354 20th Avenue, Lakewood, Colorado 80215, US [US, US], for US only;
SEIBERT, Michael, 13134 Yale Place, Lakewood, Colorado 80228, US [US, US], for US only

AGENT: WHITE, Paul, J.$, National Renewable Energy Laboratory, 1617 Cole Boulevard, Golden, Colorado 80401$, US

LANGUAGE OF FILING: English
LANGUAGE OF PUBL.: English
DOCUMENT TYPE: Patent
PATENT INFORMATION:

NUMBER	KIND	DATE
WO 2004093524	A2	20041104

DESIGNATED STATES
W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
RW (ARIPO): BW GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
RW (EAPO): AM AZ BY KG KZ MD RU TJ TM
RW (EPO): AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO SE SI SK TR
RW (OAPI): BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

APPLICATION INFO.: WO 2004-US11830 A 20040416
PRIORITY INFO.: US 2003-60/464,081 20030418

ABEN The invention provides oxygen-resistant iron-hydrogenases ([Fe]-hydrogenases) for use in the production of H<sb>2</sb>. Methods used in the design and engineering of the oxygen-resistant [Fe]-hydrogenases are disclosed, as are the methods of transforming and culturing appropriate host cells with the oxygen-resistant [Fe]-hyrdogenases. Finally, the invention provides methods for utilizing the transformed, oxygen insensitive, host cells in the bulk production of H<sb>2</sb> in a light catalyzed reaction having water as the reactant.

ABFR La presente invention concerne des hydrogenases de fer resistant a l'oxygene ([Fe]-hydrogenases) et destinees a la production de H<sb>2</sb>. L'invention concerne egalement des procedes utilises pour realiser et produire par genie biochimique ces [Fe]-hydrogenases resistant a l'oxygene, mais aussi des procedes pour transformer et cultiver les cellules hotes appropriees avec les [Fe]-hydrogenases resistant a l'oxygene. L'invention concerne enfin des procedes permettant d'utiliser les cellules hotes transformees et insensibles a l'oxygene, pour la production en masse de H<sb>2</sb> dans une reaction photocatalysee utilisant l'eau comme agent en reaction.

L33 ANSWER 36 OF 54 PCTFULL COPYRIGHT 2005 Univentio on STN
ACCESSION NUMBER: 2002020811 PCTFULL ED 20020705 EW 200211
TITLE (ENGLISH): MODIFIED TET-INDUCIBLE SYSTEM FOR REGULATION OF GENE EXPRESSION IN PLANTS
TITLE (FRENCH): SYSTEME INDUCTIBLE TET MODIFIE PERMETTANT LA REGULATION DE L'EXPRESSION GENIQUE DANS DES PLANTES
INVENTOR(S): GOLOVKO, Andrei, 300 Ford Road, #K-41, Bristol, PA 19007, US [US, US];
HALL, Gerald, Jr., 142 Rice Drive, Morrisville, PA 19067, US [US, US]
PATENT ASSIGNEE(S): BASF PLANT SCIENCE GMBH, 67056 Ludwigshafen, DE [DE, DE], for all designates States except US;
GOLOVKO, Andrei, 300 Ford Road, #K-41, Bristol, PA 19007, US [US, US], for US only;
HALL, Gerald, Jr., 142 Rice Drive, Morrisville, PA 19067, US [US, US], for US only
AGENT: BIEBERBACH, Andreas$, c/o BASF Aktiengesellschaft, 67056 Ludwigshafen$, DE
LANGUAGE OF FILING: English
LANGUAGE OF PUBL.: English
DOCUMENT TYPE: Patent
PATENT INFORMATION:

NUMBER	KIND	DATE
WO 2002020811	A2	20020314

DESIGNATED STATES
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
RW (ARIPO): GH GM KE LS MW MZ SD SL SZ TZ UG ZW
RW (EAPO): AM AZ BY KG KZ MD RU TJ TM
RW (EPO): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
RW (OAPI): BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
APPLICATION INFO.: WO 2001-EP10315 A 20010907
PRIORITY INFO.: US 2000-60/231,522 20000909

ABEN The present invention relates to modified tetracycline-inducible cassettes for controlling gene expression in organisms, particularly plants. Specifically, the invention provides novel tetracycline repressor and operator cassettes. The invention preferably provides a tetracycline-inducible expression cassette comprising both the tetracycline repressor and operator cassettes of the present invention wherein the repressor and operator cassettes are located on a single plasmid and/or vector. Also provided is a method of producing herbicide resistant plants using the modified tetracycline inducible cassettes of the present invention to control the expression of a herbicide resistance gene. Moreover, a method for identifying novel tetracycline analogs and/or functional equivalents using the modified tetracycline inducible cassettes of the present invention is also presented.

ABFR La presente invention concerne des cassettes inductibles par la tetracycline modifiees permettant de reguler l'expression genique dans des organismes, en particulier, des plantes. Plus particulierement, l'invention concerne des nouvelles cassettes operateurs et represseurs de la tetracycline. De preference, l'invention concerne une cassette d'expression inductible par la tetracycline comprenant a la fois les cassettes operateurs et represseurs de la tetracycline decrites dans

cette invention, ces cassettes operateurs et represseurs etant situees sur un seul plasmide et/ou vecteur. L'invention concerne egalement un procede permettant de produire des plantes resistant aux herbicides a l'aide de ces cassettes inductibles par la tetracycline modifiees pour reguler l'expression d'un gene resistant aux herbicides. De plus, l'invention concerne une methode permettant d'identifier des nouveaux analogues de la tetracycline et/ou des nouveaux equivalents fonctionnels a l'aide desdites cassettes inductibles par la tetracycline modifiees.

L33 ANSWER 37 OF 54 PCTFULL COPYRIGHT 2005 Univentio on STN
ACCESSION NUMBER: 2002016625 PCTFULL ED 20020711 EW 200209
TITLE (ENGLISH): PLANT POLYNUCLEOTIDES ENCODING NOVEL PRENYL PROTEASES
TITLE (FRENCH): POLYNUCLEOTIDES VEGETAUX CODANT DE NOUVELLES PROTEASES PRENYLE
INVENTOR(S): MITTENDORF, Volker, 2 Crestbury Court, Durham, NC 27713, US [DE, US];
HENKES, Stefan, 1027 Waterford Forrest, Cary, NC 27513, US [DE, US];
DA COSTA E SILVA, Oswaldo, 203 Littleford Lane, Apex, NC 27502, US [BR, US]
PATENT ASSIGNEE(S): BASF PLANT SCIENCE GMBH, 67056 Ludwigshafen, DE [DE, DE], for all designates States except US;
HAERTEL, Heiko, 5804 Tattersall Drive, Apartment 15, Durham, NC 27713, US [US, DE], for all designates States except US;
MITTENDORF, Volker, 2 Crestbury Court, Durham, NC 27713, US [DE, US], for US only;
HENKES, Stefan, 1027 Waterford Forrest, Cary, NC 27513, US [DE, US], for US only;
DA COSTA E SILVA, Oswaldo, 203 Littleford Lane, Apex, NC 27502, US [BR, US], for US only
AGENT: WARREN, William, L.$, Sutherland Asbill & Brennan LLP, 999 Peachtree Street, NE, Atlanta, GA 30309-3996$, US
LANGUAGE OF FILING: English
LANGUAGE OF PUBL.: English
DOCUMENT TYPE: Patent
PATENT INFORMATION:

NUMBER	KIND	DATE
WO 2002016625	A2	20020228

DESIGNATED STATES
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
RW (ARIPO): GH GM KE LS MW MZ SD SL SZ TZ UG ZW
RW (EAPO): AM AZ BY KG KZ MD RU TJ TM
RW (EPO): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
RW (OAPI): BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
APPLICATION INFO.: WO 2001-US26854 A 20010827
PRIORITY INFO.: US 2000-60/227,794 20000825
ABEN The present invention provides novel polynucleotides encoding plant prenyl protease polypeptides, fragments and homologs thereof. Also provided are vectors, host cells, antibodies, and recombinant methods for producing said polypeptides. The invention further provides novel polynucleotides encoding plant promoters, polypeptides, fragments and homologs thereof. The invention further relates to methods of applying

these novel plant polypeptides to the identification, prevention, and/or conferment of resistence to various plant diseases and/or disorders, particularly drought resistence.

ABFR La presente invention concerne de nouveaux polynucleotides codant des polypeptides de prenyle protease vegetaux, ainsi que des fragments et des homologues de ceux-ci. L'invention concerne egalement des vecteurs, des cellules hotes, des anticorps, ainsi que des methodes de recombinaison permettant d'obtenir ces polypeptides. Par ailleurs, l'invention concerne de nouveaux polynucleotides codant des protomeres vegetaux, ainsi que les polypeptides, fragments et homologues de ceux-ci. L'invention concerne enfin des methodes d'application de ces nouveaux polypeptides vegetaux dans l'identification, la prevention, et/ou le renforcement de leur resistance a divers troubles et/ou maladies vegetales, en particulier la resistance a la secheresse.

L33 ANSWER 38 OF 54 PCTFULL COPYRIGHT 2005 Univentio on STN
ACCESSION NUMBER: 2002016423 PCTFULL ED 20020711 EW 200209
TITLE (ENGLISH): PLANT POLYNUCLEOTIDES ENCODING NOVEL Na<sp>+</sp>/H<sp>+</sp> ANTIPORTERS
TITLE (FRENCH): POLYNUCLEOTIDES DE PLANTES CODANT DES ANTIPORTS Na<sp>+</sp>/H<sp>+</sp>
INVENTOR(S): DA COSTA E SILVA, Oswaldo, 203 Littleford Lane, Apex, NC 27502, US [BR, US];
ISHITANI, Manabu, 1103 Millhouse Drive, Cary, NC 27513, US [JP, US]
PATENT ASSIGNEE(S): BASF PLANT SCIENCE GMBH, 67056 Ludwigshafen, DE [DE, DE], for all designates States except US;
DA COSTA E SILVA, Oswaldo, 203 Littleford Lane, Apex, NC 27502, US [BR, US], for US only;
ISHITANI, Manabu, 1103 Millhouse Drive, Cary, NC 27513, US [JP, US], for US only
AGENT: WARREN, William L.$, Sutherland Asbill & Brennan LLP, 999 Peachtree Street, NE, Atlanta, GA 30309-3996$, US
LANGUAGE OF FILING: English
LANGUAGE OF PUBL.: English
DOCUMENT TYPE: Patent
PATENT INFORMATION:

NUMBER	KIND	DATE
WO 2002016423	A2	20020228

DESIGNATED STATES
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
RW (ARIPO): GH GM KE LS MW MZ SD SL SZ TZ UG ZW
RW (EAPO): AM AZ BY KG KZ MD RU TJ TM
RW (EPO): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
RW (OAPI): BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
APPLICATION INFO.: WO 2001-US26550 A 20010824
PRIORITY INFO.: US 2000-60/227,974 20000825

ABEN The present invention provides novel polynucleotides encoding plant Na<sp>+</sp>/H<sp>+</sp> antiporter polypeptides, fragments and homologs thereof. Also provided are vectors, host cells, antibodies, and recombinant methods for producing said polypeptides. The invention further relates to methods of applying these novel plants polypeptides to the identification, prevention, and/or conferment of resistence to

various plant diseases and/or disorders, particularly those associated with modulating environmental stress responses, such as drought and salt tolerance.

ABFR L'invention concerne des polynucleotides codant des polypeptides antiports Na<sp>+</sp>/H<sp>+</sp> de plantes, y compris leurs fragments et homologues. L'invention concerne egalement des vecteurs, des cellules hotes, des anticorps et des procedes de recombinaison permettant d'elaborer ces polypeptides. L'invention concerne en outre des procedes relatifs a l'utilisation des polypeptides consideres pour l'identification et la prevention d'un certain nombre de maladies et/ou de troubles affectant les plantes, y compris l'amelioration de la resistance a ces maladies et/ou troubles, en particulier dans les cas associes a la modulation des reponses au stress environnemental (par exemple, secheresse et tolerance au sel).

L33 ANSWER 39 OF 54 PCTFULL COPYRIGHT 2005 Univentio on STN
ACCESSION NUMBER: 2000049157 PCTFULL ED 20020515
TITLE (ENGLISH): COMPOSITIONS AND METHODS FOR ALTERING SULFUR CONTENT IN PLANTS
TITLE (FRENCH): COMPOSITIONS ET PROCEDES POUR MODIFIER LA TENEUR EN SOUFRE DE PLANTES
INVENTOR(S): HANSON, Andrew, D.;
GAGE, Douglas, A.
PATENT ASSIGNEE(S): UNIVERSITY OF FLORIDA;
MICHIGAN STATE UNIVERSITY;
HANSON, Andrew, D.;
GAGE, Douglas, A.
LANGUAGE OF PUBL.: English
DOCUMENT TYPE: Patent
PATENT INFORMATION:

NUMBER	KIND	DATE
WO 2000049157	A2	20000824

DESIGNATED STATES
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

APPLICATION INFO.:	WO 2000-US4542	A	20000222
PRIORITY INFO.:	US 1999-60/121,038		19990222

ABEN Disclosed are compositions and methods for increasing the nutritional value of plants and plant parts. In illustrative embodiments S-adenosylmethionine:methionine S-methyltransferase polynucleotide and polypeptide compositions are disclosed as well as their use in modulating the levels of organic sulfur compounds, and particularly, sulfur-containing amino acids in plants and seeds derived therefrom.

ABFR L'invention concerne des compositions et procedes permettant d'augmenter la valeur nutritionnelle de plantes et de parties de plantes. Certaines realisations de l'invention concernent des compositions polynucleotides et polypeptides a S-adenosylmethionine:methionine

S-methyltransferase et leur utilisation pour moduler les teneurs en composes organo-souffres, en
particulier, les acides amines soufres dans les plantes et semences qui en sont issues.

L33 ANSWER 40 OF 54 PCTFULL COPYRIGHT 2005 Univentio on STN
ACCESSION NUMBER: 1998005760 PCTFULL ED 20020514
TITLE (ENGLISH): PHOSPHATE STARVATION-INDUCIBLE PROTEINS
TITLE (FRENCH): PROTEINES POUVANT ETRE INDUITES EN CAS DE PRIVATION DE PHOSPHATE
INVENTOR(S): LEFEBVRE, Daniel, D.;
MALBOOBI, Mohammad, A.
PATENT ASSIGNEE(S): QUEEN'S UNIVERSITY AT KINGSTON;
LEFEBVRE, Daniel, D.;
MALBOOBI, Mohammad, A.
LANGUAGE OF PUBL.: English
DOCUMENT TYPE: Patent
PATENT INFORMATION:

NUMBER	KIND	DATE
WO 9805760	A2	19980212

DESIGNATED STATES
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW GH KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

APPLICATION INFO.:	WO 1997-CA532	A	19970730
PRIORITY INFO.:	US 1996-8/688,988		19960731
	CA 1996-2,182,421		19960731

ABEN This invention provides proteins, especially protein kinases, glucosidases, and phosphate
transporters which are expressed under conditions of phosphate deprivation. Further provided are
nucleic acids and nucleic acid constructs encoding these proteins, cells containing the nucleic
acids described and transgenic photosynthetic organisms with altered phosphate-inducible enzyme
activity.
ABFR Cette invention concerne des proteines, notamment des kinases, glucosidases et des agents de
transport de phosphate, lesquelles sont exprimees dans des conditions de privation de phosphate. On
decrit en outre des acides nucleiques et des constructions d'acides nucleiques codant ces proteines,
des cellules contenant les acides nucleiques decrits et des organismes transgeniques de
photosynthese possedant une activite modifiee d'enzyme induite par phosphate.

L33 ANSWER 41 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2005:274626 USPATFULL
TITLE: Synthetic and biologically-derived products produced using biomass produced by photobioreactors configured for mitigation of pollutants in flue gases
INVENTOR(S): Berzin, Isaac, Newton, MA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005239182	A1	20051027
APPLICATION INFO.:	US 2005-106695	A1	20050414 (11)

RELATED APPLN. INFO.: Continuation-in-part of Ser. No. US 2004-924742, filed on 23 Aug 2004, PENDING Continuation-in-part of Ser. No. WO 2003-US15364, filed on 13 May 2003, PENDING

	NUMBER	DATE
PRIORITY INFORMATION:	US 2003-497445P	20030822 (60)
	US 2002-380179P	20020513 (60)
	US 2004-562057P	20040414 (60)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: WOLF GREENFIELD & SACKS, PC, FEDERAL RESERVE PLAZA, 600 ATLANTIC AVENUE, BOSTON, MA, 02210-2211, US
NUMBER OF CLAIMS: 41
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 21 Drawing Page(s)
LINE COUNT: 4163

AB Certain embodiments and aspects of the present invention relate to photobioreactor apparatus designed to contain a liquid medium comprising at least one species of photosynthetic organisms therein, and to methods of using the photobioreactor apparatus as part of a production process for forming an organic molecule-containing product, such as a polymeric material and/or fuel-grade oil (e.g. biodiesel), from biomass produced in the photobioreactor apparatus. In certain embodiments, the disclosed organic molecule/polymer production systems and methods, photobioreactor apparatus, methods of using such apparatus, and/or gas treatment systems and methods provided herein can be utilized as part of an integrated combustion and polymer and/or fuel-grade oil (e.g. biodiesel) production method and system, wherein photosynthetic organisms utilized within the photobioreactor are used to at least partially remove certain pollutant compounds contained within combustion gases, e.g. CO.sub.2 and/or NO.sub.x, and are subsequently harvested from the photobioreactor, processed, and utilized as a source for generating polymers and/or organic molecule-containing products (e.g. fuel-grade oil (e.g. biodiesel)) and/or as a fuel source for a combustion device (e.g. an electric power plant generator and/or incinerator).

L33 ANSWER 42 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2005:87376 USPATFULL
TITLE: Synthetic genes for plant gums and other hydroxyproline-rich glycoproteins
INVENTOR(S): Kieliszewski, Marcia J., Albany, OH, UNITED STATES
PATENT ASSIGNEE(S): Ohio University, Technology Transfer Office, Technology (U.S. corporation)
Enterprise Building (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005074838	A1	20050407
APPLICATION INFO.:	US 2003-418032	A1	20030416 (10)

RELATED APPLN. INFO.: Continuation-in-part of Ser. No. US 2000-547693, filed on 12 Apr 2000, GRANTED, Pat. No. US 6639050
Continuation-in-part of Ser. No. US 1998-119507, filed on 20 Jul 1998, GRANTED, Pat. No. US 6548642

Continuation-in-part of Ser. No. US 1997-897556, filed on 21 Jul 1997, GRANTED, Pat. No. US 6570062
DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: CALFEE, HALTER & GRISWOLD, LLP, 1110 FIFTH THIRD CENTER, 21 EAST STATE STREET, COLUMBUS, OH, 43215-4243
NUMBER OF CLAIMS: 19
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 25 Drawing Page(s)
LINE COUNT: 6515
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A new approach in the field of plant gums is described which presents a new solution to the production of hydroxyproline(Hyp)-rich glycoproteins (HRGPs), repetitive proline-rich proteins (RPRPs) and arabinogalactan-proteins (AGPs). The expression of synthetic genes designed from repetitive peptide sequences of such glycoproteins, including the peptide sequences of gum arabic glycoprotein (GAGP), is taught in host cells, including plant host cells.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 43 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2005:75280 USPATFULL
TITLE: **Hydrogen** production with photosynthetic organisms and from biomass derived therefrom
INVENTOR(S): Berzin, Isaac, Newton, MA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005064577	A1	20050324
APPLICATION INFO.:	US 2004-924742	A1	20040823 (10)

RELATED APPLN. INFO.: Continuation-in-part of Ser. No. WO 2003-US15364, filed on 13 May 2003, PENDING

	NUMBER	DATE
PRIORITY INFORMATION:	US 2002-380179P	20020513 (60)
	US 2003-497445P	20030822 (60)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: Michael J. Pomianek, Ph.D., Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA, 02210-2206
NUMBER OF CLAIMS: 89
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 16 Drawing Page(s)
LINE COUNT: 4028
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Certain embodiments and aspects of the present invention relate to photobioreactor apparatus designed to contain a liquid medium comprising at least one species of photosynthetic organism therein, and to methods of using the photobioreactor apparatus as part of a **hydrogen** production process and system configured to generate **hydrogen** with and/or from biomass produced in the photobioreactor apparatus. In certain embodiments, the disclosed **hydrogen** production systems and methods, photobioreactor apparatus, methods of using such apparatus, and/or gas treatment systems and methods provided herein can be utilized as part of an integrated combustion and **hydrogen** production method and system, wherein photosynthetic organisms utilized within the photobioreactor are used to at least partially remove certain pollutant

compounds contained within combustion gases, e.g. CO.sub.2 and/or NO.sub.x, and are subsequently harvested from the photobioreactor, processed, and utilized as a fuel source for generating **hydrogen** and/or as a fuel source for a combustion device (e.g. an electric power plant generator and/or incinerator).

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 44 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2005:39506 USPATFULL
TITLE: Modified tet-inducible system for regulation of gene expression in plants
INVENTOR(S): Golovko, Andrei, Bristol, PA, UNITED STATES
Hall Jr, Gerald, Morrisville, PA, UNITED STATES

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 2005034187	A1	20050210	
APPLICATION INFO.:	US 2003-363657	A1	20030305	(10)
	WO 2001-EP10315		20010907	

	NUMBER	DATE
PRIORITY INFORMATION:	US 2000-231522P	20000909 (60)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: KEIL & WEINKAUF, 1350 CONNECTICUT AVENUE, N.W., WASHINGTON, DC, 20036
NUMBER OF CLAIMS: 68
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 51 Drawing Page(s)
LINE COUNT: 5664
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention relates to modified tetracycline-inducible cassettes for controlling gene expression in organisms, particularly plants. Specifically, the invention provides novel tetracycline repressor and operator cassettes. The invention preferably provides a tetracycline-inducible expression cassette comprising both the tetracycline repressor and operator cassettes of the present invention wherein the repressor and operator cassettes are located on a single plasmid and/or vector. Also provided is a method of producing herbicide resistant plants using the modified tetracycline inducible cassettes of the present invention to control the expression of a herbicide resistance gene. Moreover, a method for identifying novel tetracycline analogs and/or functional equivalents using the modified tetracycline inducible cassettes of the present invention is also presented.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 45 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2004:292942 USPATFULL
TITLE: Synthetic genes for plant gums and other hydroxyproline-rich glycoproteins
INVENTOR(S): Kieliszewski, Marcia J., Albany, OH, UNITED STATES

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 2004230032	A1	20041118	
APPLICATION INFO.:	US 2003-257199	A1	20030509	(10)

WO 2001-US12336 20010412

	NUMBER	DATE
PRIORITY INFORMATION:	US 2000-9547693	20000412

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: CALFEE, HALTER & GRISWOLD, LLP, 1110 FIFTH THIRD CENTER, 21 EAST STATE STREET, COLUMBUS, OH, 43215-4243
NUMBER OF CLAIMS: 35
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 20 Drawing Page(s)
LINE COUNT: 5865
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A new approach in the field of plant gums is described which presents a new solution to the production of hydroxyproline(Hyp)-rich glycoproteins (HRGPs), repetitive proline-rich proteins (RPRPs) and arabinogalactan-proteins (AGPs). The expression of synthetic genes designed from repetitive peptide sequences of such glycoproteins, including the peptide sequences of gum arabic glycoprotein (GAGP), is taught in host cells, including plant host cells.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 46 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2004:280225 USPATFULL
TITLE: Plant polynucleotides encoding novel prenyl proteases
INVENTOR(S): Haertel, Heiko, Durham, NC, UNITED STATES
Mittendorf, Volker, Durham, NC, UNITED STATES
Henkes, Stefan, Potsdam, GERMANY, FEDERAL REPUBLIC OF
Silva, Oswaldo da Costa e, Rheinland-Pfalz, GERMANY, FEDERAL REPUBLIC OF

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 2004219525	A1	20041104	
APPLICATION INFO.:	US 2003-362902	A1	20030827	(10)
	WO 2001-US26854		20010827	

	NUMBER	DATE
PRIORITY INFORMATION:	US 2000-227794P	20000825 (60)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: SUTHERLAND ASBILL & BRENNAN LLP, 999 PEACHTREE STREET, N.E., ATLANTA, GA, 30309
NUMBER OF CLAIMS: 94
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 20 Drawing Page(s)
LINE COUNT: 9411
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides novel polynucleotides encoding plant prenyl protease polypeptides, fragments and homologs thereof. Also provided are vectors, host calls, antibodies, and recombinant methods for producing said polypeptides. The invention further provides novel polynucleotide, encoding plant promoters, polypeptides, fragments and homologs thereof. The invention further relates to methods of applying these novel plant polypeptides to the identification, prevention, and/or conferment of resistance to various plant diseases and/or disorders,

particularly drought resistence.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 47 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2004:267716 USPATFULL
TITLE: Methods and Compositions for Evolving Hydrogenase Genes
INVENTOR(S): Dillon, Harrison, 3797 El Centro, Palo Alto, CA, UNITED STATES 94306
PATENT ASSIGNEE(S): Solazyme, Inc., Mountain View, CA, UNITED STATES, 94040 (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 2004209256	A1	20041021	
APPLICATION INFO.:	US 2003-411910	A1	20030412	(10)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: SOLAZYME, INC., 800 WEST EL CAMINO REAL, SUITE 180, MOUNTAIN VIEW, CA, 94040
NUMBER OF CLAIMS: 63
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 17 Drawing Page(s)
LINE COUNT: 2035
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Abstract of the Disclosure

The invention provides methods and compositions for engineering microbes to generate **Hydrogen**. Some methods of the invention involve recoding of hydrogenase genes followed by subjecting the recoded genes to annealing-based recombination methods. The invention further provides methods of mating organisms that are transformed with recoded and recombined hydrogenase genes with other organisms containing different genome sequences.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 48 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2004:52621 USPATFULL
TITLE: Plant polynucleotides encoding novel na+/h+ antiporters
INVENTOR(S): Silva, Oswaldo da Costa e, Rheinland-Pfalz D-, GERMANY, FEDERAL REPUBLIC OF
Ishitani, Manabu, Cali, COLOMBIA

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 2004040054	A1	20040226	
APPLICATION INFO.:	US 2003-362962	A1	20030626	(10)
	WO 2001-US26550		20010824	

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: SUTHERLAND ASBILL & BRENNAN LLP, 999 PEACHTREE STREET, N.E., ATLANTA, GA, 30309
NUMBER OF CLAIMS: 48
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 11 Drawing Page(s)
LINE COUNT: 7811
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention provides novel polynucleotides encoding plant

Na.sup.+/H.sup.+ antiporter polypeptides, fragments and homologs thereof. Also provided are vectors, host cells, antibodies, and recombinant methods for producing said polypeptides. The invention further relates to methods of applying these novel plants polypeptides to the identification, prevention, and/or conferment of resistence to various plant diseases and/or disorders, particularly those associated with modulating environmental stress responses, such as drought and salt tolerance.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 49 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2004:13035 USPATFULL
TITLE: Synthetic genes for plant gums and other hydroxyproline-rich glycoproteins
INVENTOR(S): Kieliszewski, Marcia J., Albany, OH, UNITED STATES
PATENT ASSIGNEE(S): Ohio University, Technology Transfer Office, Technology and Enterprise Building (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004009555	A1	20040115
APPLICATION INFO.:	US 2003-437708	A1	20030514 (10)

RELATED APPLN. INFO.: Division of Ser. No. US 2000-547693, filed on 12 Apr 2000, PENDING Continuation-in-part of Ser. No. US 1998-119507, filed on 20 Jul 1998, GRANTED, Pat. No. US 6548642 Continuation-in-part of Ser. No. US 1997-897556, filed on 21 Jul 1997, GRANTED, Pat. No. US 6570062
DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: Peter G. Carroll, MEDLEN & CARROLL, LLP, Suite 350, 101 Howard Street, San Francisco, CA, 94105
NUMBER OF CLAIMS: 16
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 19 Drawing Page(s)
LINE COUNT: 4344
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A new approach in the field of plant gums is described which presents a new solution to the production of hydroxyproline(Hyp)-rich glycoproteins (HRGPs), repetitive proline-rich proteins (RPRPs) and arabinogalactan-proteins (AGPs). The expression of synthetic genes designed from repetitive peptide sequences of such glycoproteins, including the peptide sequences of gum arabic glycoprotein (GAGP), is taught in host cells, including plant host cells.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 50 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2003:232073 USPATFULL
TITLE: Modulation of sulfate permease for photosynthetic **hydrogen** production
INVENTOR(S): Melis, Anastasios, El Cerrito, CA, UNITED STATES
Wintz, Hsu-Ching Chen, El Cerrito, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003162273	A1	20030828
APPLICATION INFO.:	US 2003-350298	A1	20030122 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2002-354760P	20020204 (60)
	US 2002-377902P	20020502 (60)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: BOZICEVIC, FIELD & FRANCIS LLP, 200 MIDDLEFIELD RD, SUITE 200, MENLO PARK, CA, 94025
NUMBER OF CLAIMS: 31
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 20 Drawing Page(s)
LINE COUNT: 2426
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Sustained **hydrogen** production is obtained by the culturing of a genetically-modified **algae**, where the ability of the chloroplasts to intake sulfate is reduced or eliminated compared to wild-type **algae**. The alga is cultured in a sealed environment in a liquid or solid medium that contains sulfur, and **hydrogen** is generated continuously. Alternatively, the **algae** may be cultured in the presence of bacteria that also produce **hydrogen** gas. The **hydrogen** produced can be collected and used as a clean energy source.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 51 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2003:231965 USPATFULL
TITLE: Comparative phenotype analysis of cells, including testing of biologically active compounds
INVENTOR(S): Bochner, Barry, Alameda, CA, UNITED STATES
Morgan, Amy, Oakland, CA, UNITED STATES
PATENT ASSIGNEE(S): BIOLOG, INC. (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 2003162164	A1	20030828	
APPLICATION INFO.:	US 2002-126345	A1	20020419	(10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2001-285541P	20010420 (60)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: Christine A. Lekutis, MEDLEN & CARROLL, LLP, Suite 350, 101 Howard Street, San Francisco, CA, 94105
NUMBER OF CLAIMS: 117
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 6 Drawing Page(s)
LINE COUNT: 7164
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention relates to growing and testing any cell type in a multitest format. The present invention is suited for the characterization of microorganisms, as well as animal and plant cells. The present invention is also particularly suited for analysis of phenotypic differences between strains of organisms, including cultures that have been designated as the same genus and species. The present invention is also suited for the analysis of phenotypic differences between cell lines. In some embodiments, a gel forming matrix is used.

The present invention provides methods and compositions for the phenotypic analysis and comparison of eukaryotic, as well as prokaryotic cells. The present invention further provides novel methods and compositions for testing the effect(s) of biologically active chemicals on various cells.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 52 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2003:128671 USPATFULL
TITLE: Plant methionine synthase gene and methods for increasing the methionine content of the seeds of plants
INVENTOR(S): Falco, Saverio Carl, Arden, DE, UNITED STATES
Famodu, Omolayo O., Newark, DE, UNITED STATES
Rafalski, Jan Antoni, Wilmington, DE, UNITED STATES
Ramaker, Michael Lee, Greenville, DE, UNITED STATES
Tarczynski, Mitchell Christian, West Des Moines, IA, UNITED STATES
Thorpe, Catherine, Cambridgeshire, UNITED KINGDOM

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003088886	A1	20030508
APPLICATION INFO.:	US 2002-989339	A1	20020128 (9)

RELATED APPLN. INFO.: Continuation of Ser. No. US 1999-377431, filed on 19 Aug 1999, ABANDONED Continuation-in-part of Ser. No. US 1996-703829, filed on 27 Aug 1996, ABANDONED

	NUMBER	DATE
PRIORITY INFORMATION:	US 1995-2973P	19950830 (60)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805
NUMBER OF CLAIMS: 11
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 9 Drawing Page(s)
LINE COUNT: 3880
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention relates to a nucleic acid fragment encoding a plant 5-methyltetra-hydropteroyltriglutamate-homocysteine methyltransferase or methionine synthase. The invention also includes chimeric genes, a first encoding a plant methionine synthase (MS) gene, a second encoding a plant cystathionine γ-synthase (CS) gene, a third encoding feedback-insensitive aspartokinase (AK) or bifunctional feedback-insensitive aspartokinase-homoserine dehydrogenase (AK-HDH), which is operably linked to a plant chloroplast transit sequence, and a fourth encoding a methionine-rich protein, all operably linked to plant seed-specific regulatory sequences. Methods for their use to produce increased levels of methionine in the seeds of transformed plants are provided.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 53 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2003:285296 USPATFULL

TITLE: Synthetic genes for plant gums and other hydroxyproline-rich glycoproteins
INVENTOR(S): Kieliszewski, Marcia J., Albany, OH, United States
PATENT ASSIGNEE(S): Ohio University, Athens, OH, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6639050	B1	20031028
APPLICATION INFO.:	US 2000-547693		20000412 (9)

RELATED APPLN. INFO.: Continuation-in-part of Ser. No. US 1997-897556, filed on 21 Jul 1997
DOCUMENT TYPE: Utility
FILE SEGMENT: GRANTED
PRIMARY EXAMINER: Low, Christopher S. F.
ASSISTANT EXAMINER: Kam, Chih-Min
LEGAL REPRESENTATIVE: Medlen & Carroll, LLP
NUMBER OF CLAIMS: 7
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 23 Drawing Figure(s); 19 Drawing Page(s)
LINE COUNT: 5020
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A new approach in the field of plant gums is described which presents a new solution to the production of hydroxyproline(Hyp)-rich glycoproteins (HRGPs), repetitive proline-rich proteins (RPRPs) and arabinogalactan-proteins (AGPs). The expression of synthetic genes designed from repetitive peptide sequences of such glycoproteins, including the peptide sequences of gum arabic glycoprotein (GAGP), is taught in host cells, including plant host cells.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L33 ANSWER 54 OF 54 USPATFULL on STN
ACCESSION NUMBER: 2000:98230 USPATFULL
TITLE: Phosphate starvation-inducible proteins
INVENTOR(S): Lefebvre, Daniel D., Kingston, Canada
Malboobi, Mohammed A., Kingston, Canada
PATENT ASSIGNEE(S): Queen's University at Kingston, Kingston, Canada (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6096545		20000801
APPLICATION INFO.:	US 1996-688988		19960731 (8)

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Achutamurthy, Ponnathapu
ASSISTANT EXAMINER: Nashed, Nashaat T.
LEGAL REPRESENTATIVE: Hamilton, Brook, Smith & Reynolds, P.C.
NUMBER OF CLAIMS: 25
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 33 Drawing Figure(s); 28 Drawing Page(s)
LINE COUNT: 4664
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention provides proteins, especially protein kinases and glucosidases, which are expressed under conditions of phosphate deprivation. Further provided are nucleic acids and nucleic acid constructs encoding these proteins, cells containing the nucleic acids described and transgenic photosynthetic organisms with altered

phosphate-inducible enzyme activity.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.